This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

LANE MEDICAL LIBRARY STANFORD
L778 .M98 1889 STOR
Chronic bronchitis and its treatment : a
24503321395

RONIC BRONCHITIS

MURRELL

LANE

MEDICAL LIBRARY

LEVI COOPER LANE FUND

CHRONIC BRONCHITIS

THE ABERDEEN UNIVERSITY PRESS.

CHRONIC BRONCHITIS

AND ITS TREATMENT

A Clinical Study

BY

WILLIAM MURRELL, M.D., F.R.C.P.

LECTURER ON PHARMACOLOGY AND THERAPEUTICS AT THE WESTMINSTER HOSPITAL; LATE EXAMINER IN MATERIA MEDICA IN THE UNIVERSITY OF EDINBURGH AND IN THE ROYAL COLLEGE OF PHYSICIANS OF LONDON

PHILADELPHIA

P. BLAKISTON, SON & Co., 1012 WALNUT STREET

1889

LANE LIBRARY

L778
M98
1889

PREFACE.

THIS is not a book which requires any elaborate preface. It is a simple record of Clinical Work extending over a period of about ten years. The notes for the most part have been taken either at the bedside or in the out-patient room. There has been no attempt at book-making, and the patients have been allowed to tell the story pretty much in their own words. If I have done anything to improve the methods of treating Chronic Bronchitis and Winter Cough, I am satisfied.

WILLIAM MURRELL.

38 WEYMOUTH STREET,
PORTLAND PLACE, LONDON, W.
November 1st, 1889.

CONTENTS.

CHAPTER I.

INTRODUCTORY, - - - - - - - - - - 1

CHAPTER II.

THE IPECACUANHA AND OTHER SPRAYS, - - - - 9

CHAPTER III.

TAR AND ITS ALLIES, - - - - - - - - - 56

CHAPTER IV.

PURE TEREBENE AND ITS ALLIES, - - - - - 88

CHAPTER V.

CHEKEN AND CUBEBS, - - - - - - - - 177

CHAPTER VI.

CHLORIDE OF AMMONIUM INHALATIONS, - - - - 133

CHAPTER VII.

FUMING INHALATIONS, - - - - - - - 159

BRONCHITIS.

CHAPTER I.

INTRODUCTORY.

THERE is probably no complaint more prevalent in England, and especially in London, than Winter Cough. It derives its importance not from its fatality but from the fact that it returns year after year with unvarying regularity, rendering the life of the unfortunate sufferer miserable and incapacitating him from following his avocations. We recognise it clinically, being only too familiar with its salient features, although, curiously enough, it corresponds to no definite pathological condition. It may be said to be of a somewhat composite character, including as it does bronchial catarrh, chronic bronchitis with or without emphysema, bronchiectasis, and a small percentage of cases of quiescent or arrested phthisis. The people who

suffer from this condition are chiefly those who from the nature of their occupations are exposed to the inclemency of the weather. In the hospital, for example, we see it amongst fishmongers, who have to get up early and who transact their business in open shops; in bargees and lightermen, who periodically fall into the Thames and have to be revived with gallons of beer; in cabmen, who are exposed to all sorts and conditions of climatic influences; in unattached clergymen, who bare-headed hold forth in the streets and alleys; and in furnace-men and gas-workers, who are usually frozen on one side and roasted on the other. In women it is just as common, their periodical attempts to improve the census returns lowering their powers of resistence and leaving them very susceptible to atmospheric changes. In the out-patient department of our hospitals we meet with it in laundresses, ironers, and charwomen, and people of that class. It would seem that constant exposure to the fumes of the wash-tub, with the combined odour of soft soap and dirty linen, is somewhat trying to the mucous membrane of the bronchial

tubes; whilst the pursuit of charring, with the accompaniment of something short, usually in the shape of a glass of raw gin, is equally inimical.

The chief symptoms of the complaint are cough and expectoration, shortness of breath, especially on exertion, and a sense of pain or rawness in the chest and behind the sternum. There is as a rule no constitutional disturbance, and after the first few days of the recurrent attack the temperature is not elevated and there is no quickening of the pulse. The patient may lose flesh, but as a rule it is only a temporary and not a progressive loss.* The winter cougher is rarely thin or emaciated, and often turns the scale in the neighbourhood of eighteen stone. The cough is as a rule his chief trouble and the one from which he is most anxious to be relieved, but sometimes the dyspnœa, from the inconvenience which it affords him, monopolises his attention. The cough, it must be remembered, is

* In some cases, however, as Walshe has pointed out, "as much weight is lost during the first three weeks of an annual recurrence of chronic bronchitis as during the same period in the average of cases of consumption in active progress". This, however, is exceptional.

not a little hacking, lady-like cough such as you get in the early stage of phthisis, but a violent paroxysmal cough which comes on in gusts and lasts for some time. It is bad all day, but it is especially bad the first thing in the morning, before the patient has succeeded in "clearing his chest". This cough is a nuisance not only to the patient himself but to a large circle of his acquaintance. The expectoration usually flows freely, and consists of yellowish white muco-purulent matter, with an occasional touch of green. Sometimes it is fœtid, the odour being due to sloughs of minute portions of the mucous membrane or to commencing decomposition in the sputum itself. On microscopical examination the sputa is seen to consist of epithelium, pus cells, and granular matter, with perhaps a few blood corpuscles. In the condition known as Bronchorrhœa it is extremely copious and is usually thin and watery, but it may be thick, ropy, sticky matter not unlike the white of egg. In exceptional cases there is no expectoration at all, the bronchitic condition assuming the form which is sometimes known as *catarrhe sec.* Sometimes, too,

instead of the orthodox expectoration, casts of the bronchial tubes make their appearance and are expelled with difficulty. They may be either solid or hollow, and on examination are found to consist of concentric laminæ of amorphous or fibrillar material. In ordinary cases of Winter Cough the patient rarely spits blood in any quantity, although occasionally the sputum may be streaked as the result of an unusually violent attack of cough. In Bronchiectasis, however, there is often abundant hæmoptysis from the dilated bronchial tube, the quantity being as great as in phthisis. Next to the cough the dyspnœa is the most troublesome symptom. It is especially trying to the patient, as it incapacitates him for exertion of any kind. He is all right as long as he keeps quiet, but as soon as he attempts to hurry he gets out of breath and has to come to a full stop. He cannot walk fast, much less run, and hurrying to catch a train is out of the question. He presents the appearance of a person who is chronically out of breath, and when the dyspnœa is at its height there is a certain lividity about the face which gives him a peculiarly pained and anxious expression.

On a physical examination of the chest nothing wrong may be detected, but in old-standing cases there is always more or less emphysema, the antero-posterior diameter being increased, respiration divided, and expiration prolonged. Expansion is usually deficient, and it may be difficult to get the patient to take a deep breath. The breath sounds are harsh and loud, and are often accompanied by dry, coarse, moist, or bubbling ronchi. The moist sounds are usually heard most distinctly at the bases of the lungs posteriorly, and often they can be detected only the first thing in the morning. The successive long-continued attacks lead in time to the development of other structural changes ; the mucous membranes secrete more abundantly than natural, even during the quiescent period of the disease; the right side of the heart becomes dilated and hypertrophied ; systemic venous congestion ensues, and finally anasarca, and hepatic and renal complications follow. The bronchitis itself rarely or never kills except in very old people, but indirectly it only too surely paves the way for death.

Such, then, is a brief sketch of the symptoms of

a common complaint which is only too familiar to everyone. Respecting its treatment our text-books are somewhat reticent. We are usually told that counter-irritants, inhalations, stimulating medicines, tonics, and good diet are indicated, whilst especial attention should be paid to hygienic measures. This, to say the least of it, is unsatisfactory, and I cannot help thinking that there are certain modes of treatment over and above these which may in suitable cases be resorted to with advantage. During the last ten years I have carried out systematic observations on this point, and I am satisfied that much may be done, if not to cure our patients, at all events to alleviate their sufferings. In the medical out-patient practice of a general hospital cases of chronic bronchitis largely preponderate, and during the winter months they form the great bulk of patients under treatment. My clinical clerks have taken notes of a great many cases, and of their observations I have not hesitated to avail myself freely. Many of the patients come to us for treatment year after year, so that their histories during a succession of attacks are familiar to us.

They in time become experts, so that they are enabled to tell with an accuracy almost approaching certainty what special drug or mode of treatment suits them best. Many of them are keen observers, and although we have to guide them at first, they after a time are in a position to afford us valuable information. As a rule some special method of treatment has been tried every winter, but from this we do not hesitate to depart as necessity arises. New modes of treatment have been grafted on the old, but have not been employed to their exclusion. The indications for the employment of each drug have been carefully noted, so that in any given case a fair amount of accuracy has been arrived at in prescribing the appropriate remedy. The old-fashioned expectorant mixtures have been prescribed without stint, but when they fail, as is not uncommonly the case, we do not hesitate to resort to other methods of treatment.

CHAPTER II.

THE IPECACUANHA AND OTHER SPRAYS.

THE first method of treating Chronic Bronchitis to be considered is one originally introduced into practice by Dr. Ringer and myself, and described in a paper, "On Ipecacuanha Spray in Winter Cough and Bronchitic Asthma," which appeared in the *Lancet* of September 5, 1874. We had heard a great deal about the successful use of a secret remedy for these complaints by an irregular practitioner both in London and Paris, and thought that we should be doing good service if we were to unearth it and publish our results. We had very little to guide us, for apparently the proprietor of the remedy varied its composition from time to time to escape detection. Some people said it was a clear fluid-like water, whilst others were equally confident that it was coloured; some of them affirming that it was yellow, whilst others thought it was bright red, or even blue. Some were sure it

was tasteless; others were equally positive they recognised the not unfamiliar flavour of sherry. They all agreed, however, that it was used as a spray, and that the results were little short of marvellous, a few inhalations affording prompt relief both to the cough and shortness of breath. It always loosened the phlegm, and frequently gave rise to copious expectoration. It obviously belonged to the class of remedies which we call expectorants, and there was no reason to suppose that it was a rare or unknown drug. Our sphere of investigation was, fortunately, considerably narrowed, for many remedies are obviously unsuited for administration in this particular form. We made a number of trials, which served to convince us that even if the secret remedy were not Ipecacuanha Wine, that very simple and familiar medicine entered largely into its composition, and that, when used as a spray, it formed a most useful application for congested and irritated bronchial mucous membranes.

To prevent any misconception respecting the nature of the cases treated, the following is given

as a typical example, although it is not the record of any one case, but simply the reflection of a large number :

The patient has been troubled with winter cough, perhaps, for many years. During the summer he is pretty well ; but during the cold months, from October to May, he suffers sometimes without intermission, occasionally getting a little better and then catching cold ; or perhaps he may lose the cough for a few weeks, but again takes cold on the slightest exposure. His breathing is so short that he can walk only a few yards, especially in the cold air, and finds it hard work to get upstairs, and is often quite unfitted for active life. The breathing grows worse at night, so that he cannot sleep unless the head is propped up with pillows. He is troubled, too, with paroxysmal dyspnœa, usually at night, lasting several hours, and compelling him to sit up in bed. Sometimes the breathing is difficult only on exertion, and in those cases it is made much worse by fogs, east winds, and damp. The expectoration varies greatly : in a few cases there is very little ; usually, however, it is rather

abundant, and consists of mucus or pus. The cough is violent, frequent, hacking, and paroxysmal, the fits lasting from ten to twenty minutes, and perhaps even exciting vomiting. They are generally brought on by exertion, and, in bad cases, the patient is almost afraid to speak, much less to move. Sometimes the cough is slight, and then the expectoration is generally scanty, the distressed breathing being the chief symptom. The patient wheezes badly, especially at night, and the legs are swollen. He is distinctly emphysematous ; there is often no rhonchus, but there may be a little sonorous or sibilant rhonchus or bubbling, especially at the bases behind.

The apparatus employed was very simple, consisting of nothing more elaborate than a common double-ball spray apparatus such as is used for the production of anæsthesia by ether. The observations were made originally in the months of January and February, and the first series of cases included twenty-five patients. It is only fair to say that they were all bad cases, for we purposely selected the most intractable we could find. Some

were men and some women, their ages ranging from thirty to seventy. They were not confined to the house, but were allowed to follow their ordinary avocations. Most of them had been sufferers for a good many years, so that they were not very sanguine as to the result, having had abundant experience of other methods of treatment. At first pure Ipecacuanha Wine was used, but after a time it was found advantageous to dilute it with twice its bulk of water.

Sometimes the first application of the pure wine excites a paroxysm of cough, lasting for some minutes, so that caution has to be exercised in its use. As a rule, however, patients get accustomed to it after a few trials, and take it freely into the lungs. Some people involuntarily arch up the tongue, so as to bring it in contact with the roof of .the mouth, and obstruct the passage of air; but as they gain confidence they cease to do so, and no difficulty is experienced. As they go on inhaling, they take it more and more freely, until at last they declare that they can feel it going right down to the bottom of the chest. The short-

ness of breath is the first symptom relieved, and many patients report that, after the first inhalation, they have a good night's rest, even when for weeks previously their rest had been broken by fits of coughing and paroxysms of dyspnœa. The shortness of breath on exertion is also promptly relieved, the patients often walking home after a single application with an absence of effort which surprises both themselves and their friends. In some instances the expectoration is increased for the first few days, but this is a good sign, and may be taken as an indication that there will soon be some amelioration of the cough. The improvement is noticed in spite of exposure to cold, and fog, and damp, and even east winds.

Of the twenty-five patients referred to as constituting the first series, all except one were materially benefited. Since then the treatment has been adopted in a much larger number of cases, and equally good results have been obtained. A few typical instances are given in detail to indicate the progress of the improvement. The first and second cases are old ones and are re-

produced from the article already referred to, whilst the others have been under observation this winter.

CASE I.—This is a favourable case, in which the benefit was prompt and decided :

"Jane H., aged 72, has had a cough every winter for the last three years. It comes on in fits, and is especially bad at night, being greatly aggravated by foggy weather. She expectorates about a teacupful of thick yellow phlegm in the twenty-four hours. So bad is her breath, that she cannot lie down at night, but is propped up with pillows, and is always wheezing. She is obliged to stay at home for weeks together. Her lungs are emphysematous, and sonorous râles are heard over the whole chest. After the first inhalation there was marked improvement, there being little or no cough at night and not much shortness of breath. Further improvement was noticed after the next day's inhalation, and still more after the third ; so that on the sixth day of treatment, and after three inhalations, she said that her breathing was not nearly so troublesome, and that she did

not spit half so much. The expectoration, instead of being thick and yellow, was white and frothy. At the end of a fortnight she was well enough to take charge of a small shop, although previous to her attendance at the hospital she had not been out of her room for four months. She came, a month later, to say that there had been no relapse."

CASE II.—The next is a fair specimen of an obstinate case treated by the same method:

"Mary A., æt. 32, came to the hospital on January 29th, with a winter cough of many years' standing. She reports that it is worse this year than it has ever been before. It is paroxysmal, the slightest exertion, even talking, bringing on an attack. The attacks vary much in duration, but rarely last less than ten minutes. In the twenty-four hours she expectorates quite a teacupful of thick yellow phlegm. She is extremely short of breath, is quite unable to do her house-work, and at night cannot sleep unless propped up with three pillows and a bolster. The breathing is worse at night, and fog increases all her troubles. She has been hoarse for weeks, and her voice goes

if she attempts to talk. Her chest is very sore from coughing, and she aches all over. She is emphysematous, and the breath sounds are obscured by cooing râles. On February 3rd the patient, who had an inhalation on five consecutive days, said she was better in every way. The breathing was easier, the cough was not so violent, her chest was not so sore, the expectoration was less, and the hoarseness had nearly gone. Three days later, the inhalations having been continued meanwhile, she reported that she was better than she had been all the winter. The improvement in her breathing is so great that she can now do with only one pillow instead of three. She sleeps better, and there has been great improvement in the cough, which, instead of being aggravated at bedtime, is easier. Expectoration has almost ceased. On the 10th, having had no inhalation for three days, she complained that there was shortness of breath. On the 12th, after two more inhalations, it was better. On the 17th the note was: 'Has had but one inhalation since last date. The cough has now almost left her, and she often

goes twelve hours without a fit. Her breathing is so much better that she does her own house-work, and is not propped up at night.' She was discharged after ten inhalations and nineteen days' treatment. A month later she called and said that her breathing was all right, and that, with the exception of a slight hacking cough, she had been perfectly well since her discharge."

The number of inhalations required in most cases of Winter Cough ranges from four to eighteen. The longest case under treatment was twenty-four days. One inhalation a day will usually suffice to effect a cure, but better and more speedy results are obtained when the patient can inhale night and morning, or even three or four times a day. The fluid which accumulates in the mouth from the spray should not be swallowed, or it may excite nausea. The duration of the inhalation varies in different cases and in different stages, but it should rarely exceed ten minutes.

The Ipecacuanha Spray was used with very satisfactory results in several cases, of which the following may be taken as a type:

"A patient for several years has suffered from severe Winter Cough, with much dyspnœa, cough, and expectoration, and on several occasions has spat up a considerable quantity of blood. The physical signs denote slight fibroid consolidation, with excavation at both apices, and much emphysema, perhaps atrophous in kind. There is little or no rhonchus and no fever. The expectoration may be slight or very abundant, muco-purulent or purulent. The dyspnœa is perhaps very severe, and is so paroxysmal as to justify calling the case bronchial asthma, with emphysema and fibroid phthisis. In these cases the ipecacuanha spray is almost as beneficial as in the preceding. It soon controls the dyspnœa, enabling the patient to sleep, and greatly lessening expectoration and cough. As in the previous cases, the first inhalation may considerably improve the breathing, though the effects are not so permanent, the dyspnœa returning in the evening; so that spraying is needed night and morning, and may be necessary for weeks or months, the ipecacuanha appearing rather to give relief than to permanently cure dyspnœa."

I have had several cases of fibroid phthisis under treatment in which the spray has afforded very considerable relief. The following is a case in point:

CASE III.—"Fred. L., a mason, æt. 29, came to the hospital on November 20th, and gave the following history. He had a cough last winter for the first time; it lasted from Christmas to June, but he was free from it during the rest of the summer. This year he has had it seven weeks. It comes on in paroxysms, four or five in the day, each lasting from five to ten minutes. The attacks are so severe that he has often to stop in the street and hold on to the railings. He is sick after a violent attack, and this has greatly reduced his strength. The expectoration is watery, not thick, and there is usually a pint or more in the twenty-four hours. He spat blood several times last winter, but only in small quantities. The loss of flesh has been considerable, and he weighs two stone less than he did twelve months ago. He is much troubled with shortness of breath, and has some difficulty in getting upstairs. He lives only a mile from the

hospital, but it is farther than he can walk, and he has to take the omnibus. His voice is getting weaker, and he is so ill that he has done no work, except an odd job here and there, for over a month. On examining the chest, the signs of a dry cavity were apparent at the apex of the right lung. He was given an inhalation of ipecacuanha wine on three consecutive days, and at his fourth visit he said that the cough was easier than it had been for many months. The sickness in the morning had left him, and he could walk with comparatively little difficulty, and even get upstairs. He continued to improve under this treatment, although somewhat slowly; and after the sixth inhalation his chest was painted with iodine liniment over the side of the cavity. From this time he progressed much more rapidly, and at the expiration of a fortnight he was discharged, after ten inhalations, comparatively well. No other treatment was adopted."

The following is a case of phthisis, complicated with asthma, in which the the Ipecacuanha Spray was the means of affording considerable relief:

CASE IV.—"C. E. M., a French polisher, aged 30, stated that he had had a cough in the winter as long as he could remember, but never in the summer, until the present year. He usually expectorated a great deal of green, frothy material. He had spat blood at times, but only in small quantities. His most distressing symptom was shortness of breath. On going to bed he finds it impossible to lie down, but manages to get a little sleep, propped up in bed. About two o'clock he usually awakes, and then has a bad attack of cough, accompanied by expectoration. He is short of breath the greater part of the night, and in the daytime suffers severely on the slightest exertion of any kind, and he always has an attack after dinner, often lasting two hours. He is afraid to eat a good meal, and has lost in twelve months two stone in weight. He now weighs only 6 stone 7 lbs., and is so weak that it is impossible for him to follow his occupation. On examining the chest, it was found that there was consolidation at the apex of the right lung, and sibilant rhonchus was heard all over both sides,

with moist rhonchus at the bases. He was, undoubtedly, suffering from phthisis, and from the preponderance of the asthmatic element it was feared that the Ipecacuanha Spray would hardly prove suitable. It was determined, however, to give him the benefit of the doubt, and, as his condition was somewhat critical, an inhalation of the pure wine was prescribed. It, fortunately, produced no dyspnœa, and the cough was relieved, although not to any great extent. Two days later the treatment was repeated, and he then reported that it had facilitated expectoration, and relieved the shortness of breath. He had no longer the choking sensation in the throat, and his rest was less disturbed at night. The dose of the Ipecacuanha Wine was gradually increased, and on one occasion as much as an ounce was used in the Siegel's spray apparatus at one sitting. Much of this was, of course, not absorbed, as the apparatus was placed at some distance from the patient's mouth, but he derived great benefit from it, and his attacks of dyspnœa being milder and less frequent, he took considerably more food.

After the sixth inhalation it was thought right to give him cod-liver oil and Fellow's Syrup of the Hypophosphites, on which he improved still more rapidly, gaining flesh remarkably. He was sent away to a convalescent home on the south coast, and two months later he returned, and reported that he had resumed work. The result was most satisfactory, especially as the patient's condition, when first he came under observation, was undoubtedly critical. It should be mentioned that, at his last visit, his chest was re-examined, and that it was found that, although the rhonchus had entirely disappeared, the signs of consolidation at the right apex were still apparent."

In cases of bronchial asthma, the Ipecacuanha Spray sometimes aggravates the attacks; but, on the other hand, it sometimes affords very prompt relief. It is especially difficult to cure these patients without confining them to the house, as they very readily catch cold, especially in bad weather. The following is a case in point:

CASE V.—" A woman, who for many years had suffered from bronchial asthma, came to the

hospital, complaining that she was unable to lie down at night from shortness of breath. She suffered from violent paroxysmal dyspnœa, the worst attack usually coming on about three o'clock in the morning, and compelling her to start out of bed and struggle for breath. She was very emphysematous, and her voice was hoarse. The first inhalation removed the hoarseness and much improved her breathing, which continued freer till midnight, when the dyspnœa returned. The cough was eased, and she expectorated freely. Each inhalation always gave her very great and marked relief. She walked to the hospital with great difficulty, and was constrained to stop frequently. On entering the room she could not speak, but laboured violently and with loud wheezing to get her breath. A few inhalations would gradually set the breathing free, so that the air entered more and more, and the wheezing gradually left, till, on the completion of the inhalation, she could breathe without difficulty. As the breathing improved, she could feel the spray descending lower and lower into the chest. At first it would seem

to reach only the back of the tongue, then the top of the sternum, then descend to mid sternum, and at last she felt as if it reached as low as the pit of the stomach. This improvement was maintained through the day, but at evening a relapse would occur, so that her nights, though at first bad, were still better than before the treatment. Soon, however, the effects became more lasting, and she slept well. On discontinuing the spray, however, her breathing again grew worse, and she was obliged to revert to the treatment, but, unfortunately, she so soon caught cold and the weather was so bad that she was obliged to stay away for days together. Whilst her breathing improved, the cough and expectoration also improved, but these two symptoms continued rather troublesome."

In cases such as these the ipecacuanha should be freely diluted, and it is best either to warm the mixture or to add hot water. In bad cases of bronchitic asthma the spray should be used two or three times a day, and the treatment may have to be continued for some time to ward off the dyspnœa, for the bronchitis takes a considerable

time to cure. The improvement, however, is often so marked as to astonish the patient.

When there is a tendency to asthma the spray must always be used with caution and the Ipecacuanha Wine should be freely diluted, or a severe paroxysm of dyspnœa may be excited.

CASE VI.—"Charles S., aged 59, a carpenter by trade, came to the hospital complaining of a cough from which he had suffered in the winter for three years. It came on usually about November, lasted till February or March, and left him in the summer. He had several bad paroxysms every day, often as many as nine or ten, lasting from three to five minutes each. Sometimes it disturbed him at night, but usually he slept well till the early morning. The expectoration was white, frothy, and extremely abundant. His breath was very short indeed, especially on exertion, but he did not know that he had ever had an attack of asthma. He was not quite sure, but he thought the shortness of breath never came on without a previous attack of cough. His breathing was certainly very bad, and if he could only get that right he did not care so much,

he said, for the cough. He came of an asthmatic family, and his father had suffered terribly from that complaint all his life. On an examination of the chest there was found to be well marked emphysema, and his bloodvessels were noticed to have undergone marked degeneration. The patient was given an inhalation, not a large one, of equal parts of Ipecacuanha Wine and water, the Richardson's spray apparatus being employed. It was noticed that he inhaled remarkably well, the spray evidently entering the chest freely. Immediately, almost before the operation was over, the patient was seized with a violent attack of dyspnœa, and complained that he could not get his breath. He rushed to the open air, his face became livid, and he was unable to stand without support. Some chloroform was obtained, and he was made to inhale the vapour from a piece of lint. The spasm almost immediately relaxed, and in a few minutes he said that he was perfectly comfortable and could breathe easily. He came the next day and declared that the treatment had done him a great deal of good, and seemed most anxious to have it repeated. This

time a much weaker solution was given, one part of the wine to six of water, and the inhalation was confined to one hundred squeezes of the bellows. This produced no dyspnœa, but he expectorated a great deal of thick white phlegm. After this the strength of the mixture was increased to one in three, and it was given more freely, but it produced no inconvenience. On one occasion a preparation of ipecacuanha was made with rectified spirit and water of the same strength as the wine, but he greatly preferred the sherry. He had no return of the dyspnœa, and after nine inhalations was discharged perfectly well."

Since the original publication of our paper I have used the Ipecacunha Spray in about two hundred patients suffering from Chronic Bronchitis and Winter Cough, and successful cases have been recorded by the score both on the Continent and in America.

The following may be regarded as typical of a large number of cases which have been under treatment at the Westminster Hospital during the last six months:

CASE VII. (reported by Mr. E. Lucas Hughes, Clinical Assistant), showing the value of the Ipecacuanha Spray in bronchial catarrh.—" David J., æt. 53, a cigar maker by trade, has had a cough in the winter for twelve years or more. There is not much dust in his work, and he is not exposed to wet or cold, but he has travelled a good deal, and has known what it is to rough it. He has been to America fourteen times, to Australia, the Sandwich Islands, and many other places. He is fond of going about, and as he is a good hand at his work, and can always get employment, he sees no reason why he should always stay in one place. The cough is troublesome, but is not paroxysmal. There are no bad attacks of cough, but there is a good deal of hacking, and this keeps him awake at night. There is very little expectoration, certainly not enough to give him any trouble. He has had no hæmoptysis, and has not lost flesh. On examining the chest the percussion note is found to be normal. Small râles are detected at the left apex in front, and at the right base posteriorly. The patient was given 15 cc. of ipecacuanha wine with an equal

quantity of water, by a steam spray apparatus, and this was repeated on three successive days, the dose being gradually increased to 30 cc. On the fourth day the hand-ball spray was used, and at the expiration of the week the patient reported that his cough had entirely left him, and that he was practically well. On examining the chest it was found that the rhonchus had disappeared."

CASE VIII.—Case of chronic bronchitis and winter cough (reported by Mr. Hughes), illustrating strikingly the benefit which may frequently be obtained by the use of the Ipecacuanha Spray:—"Francis P., æt. 58, has suffered from winter cough for the last twenty-five years. He gets rid of it for only a short time in the summer, and for the last thirteen years it has been not a winter cough, but a winter and summer cough as well. This year he has had it badly since the beginning of December. It comes on in fits, which often last ten minutes. He always has two or three bad bouts of it in the daytime, and one or two at night. If they come on when he is out he has to cling on to the railing, or hang on to anything that may be handy. The ex-

pectoration is always thick, and it may be yellow or white, sometimes streaked with black, especially in the winter. He has never brought up any blood, with the exception of a mouthful now and then. He gets short of breath, especially on exertion, or after a bad fit of cough. His occupation is an unfavourable one, for he is engaged in heaving sacks of coals at the gas-works. He gets as hot as any man can get, he says, and then goes out or stands in a draught 'to cool down a bit'. This he thinks has tried his constitution. On examining the chest it was found that there was a little general emphysema, with sibilant rhonchus over the right front and back. Immediately the patient had been examined he was made to inhale a spray of equal parts of ipecacuanha wine and water. The Richardson's apparatus was employed, and the quantity of the diluted wine used was 5 cc. The chest was then at once re-examined, and it was found that the sibilant rhonchus had entirely disappeared from the front and had almost gone from the back. After inhaling 10 cc. more of the diluted wine the patient expectorated freely. At the expiration of

five minutes, during which 35 cc. had been sprayed, the abnormal signs had entirely disappeared from the chest. The patient came the next day, and had another inhalation of 40 cc. This was repeated on six consecutive days, when the patient reported that he was quite well. The cough had left him; there was no expectoration, the breathing was easier, and his appetite had returned. On examining the chest no rhonchus was to be found."

Fig. 1.—Steam Atomiser for Ipecacuanha Spray.

The only objection to the treatment is that it involves a daily visit from the patient, and necessitates the expenditure of a certain amount

of time and trouble. It is much easier to write a prescription than to spray a patient; but this objection fortunately does not hold good in the out-patient room of a large hospital, where we have a number of clinical clerks at our disposal, who are not only skilled observers, but are always ready and willing to help. Only this winter, at the Westminster Hospital, a number of these cases had accumulated, and were making slow progress under various expectorant mixtures. The matter was looked into, notes were taken of their symptoms, a plan was organised by which they were made to come every morning to be sprayed by the clinical clerks, and in a fortnight the majority of them were practically cured, no medicine having been given meanwhile. Some of these cases were treated by the hand-ball spray; but after a time, to save trouble, a Siegle's steam spray apparatus was introduced, and it was found that half-an-hour in the morning sufficed for the treatment of a considerable number of patients. Not only do the patients get well much more quickly than when mixtures alone

are given, but there is a considerable saving in drugs—a matter of no small importance in an hospital where treatment has to be conducted on principles of strict economy. If every hospital had in connection with its out-patient department a small room which could be devoted to the administration of drugs by inhalation, a still further saving might be effected, as the air could be rapidly impregnated with the drug, and one inhalation would suffice for a number of patients. I have sometimes ordered a small and inexpensive "fountain odorator" for patients who have been unable to attend oftener than once a week, but the spray is not so fine as with the steam apparatus, and the larger drops condense in the mouth and throat, and do not reach the finer air passages.

The mode of action of ipecacuanha in these cases is well understood. Expectorants may be divided into two classes—those which depress the heart, lessen blood-pressure, and increase secretion, and those which stimulate the heart, increase blood-pressure, and diminish secretion. Ipecacuanha belongs to the former category; but given in

small doses, as in the form of spray, it exerts little or no depressing effect, but produces an abundant secretion from the bronchial mucous membranes. It stimulates the activity of the respiratory apparatus in two ways—by increasing ciliary motion in the tracheal mucous membrane, and by acting on the respiratory centre. In *post-mortem* examinations made on animals which have been poisoned by ipecacuanha, it is found that there is intense hyperæmea of the lungs, which are in places emphysematous, but in other portions collapsed, and even affected with true consolidation. The influence of ipecacuanha in arresting bleeding is well known, and the presence of hæmoptysis is a special indication for its employment in the form of spray.

When there is well-marked diathesis, the gouty for example, it will be necessary to counteract this before much benefit can be expected from the inhalation.

The following case illustrates two points—first, the necessity for treating a gouty diathesis when present, and, secondly, the possibility of the spray

Fig. 2.—Another form of Steam Atomiser.

not being taken into the chest from arching of the tongue against the hard palate.

CASE IX.—"Mary E., a widow, and housekeeper to a gentleman, stated that she had a bad cough, with much expectoration and dyspnœa on exertion, every winter for eight years. She lived in a very cold house, and her master was excessively penurious, and rarely indulged in fires. She came of a gouty family, and had had several

bad attacks herself. She was a stout, little old lady, and must have weighed nearly sixteen stone. She was put on the usual ipecacuanha spray treatment, but after six inhalations, although the pure wine was employed, there was not the slightest improvement. She was then ordered tar, but after a fortnight's trial the cough and shortness of breath were as bad as ever. She then had a sharp attack of gout, for which she was treated vigorously with large doses of colchicum and iodide of potassium. This speedily gave relief to the more pressing symptoms, but her chest troubles were as bad as ever. The ipecacuanha spray was again essayed, and it was then noticed for the first time that she had a habit of pressing the tongue up against the palate, so as effectually to prevent the entrance of the vapour into the chest. She was told to hold her nose when inhaling, but this had not the desired effect; and finally she was induced to protrude her tongue as far as possible, the nozzle of the apparatus being introduced into her mouth. The spray was then administered without difficulty, and, after a few

applications, we had the satisfaction of seeing a marked improvement in all her symptoms. It is probable that had we taken this precaution earlier, and given at the same time full doses of colchicum, she would have made a more speedy recovery."

In making these observations with Ipecacuanha Spray, it was noticed that, when hoarseness was a prominent symptom, the voice at once became clearer, and the patient was able to sing and speak, at all events for a time, without difficulty. Sometimes there was a relapse in a few hours, but after five or six inhalations the hoarseness usually disappeared. It was found that this condition usually depended on congestion of the vocal cords, which rapidly improved under the treatment. Many cases have been treated in this way, and the following may be taken as typical illustrations:

CASE X.—"George E., æt. 51, an engine inspector on one of the railways, came to the hospital on November 27th, complaining of hoarseness. He had been quite well, he said, until about three weeks before, when he got wet through and had caught a bad cold. His voice had been

gradually getting weaker, and for some days he had been unable to speak above a whisper. He kept at his work, but could not talk much, and had, as far as possible, to convey his meaning by grunts and signs. He had never been ill before, and hardly knew what it was to have a cough. He was a big, fine fellow, but looked the picture of misery from his inability to speak. His chest was carefully examined, but nothing could be detected. On laryngoscopical examination, the vocal cords were found to be swollen and congested. He was at once given an inhalation of ipecacuanha wine—two drachms and a half—by means of a steam spray apparatus, and immediately his voice became clearer, and he could speak without much effort. He was unable to attend again until December 8th, when his voice was worse, and he could hardly speak at all. It appears that he had been to a smoking concert the night before, and could not resist the temptation of joining in the choruses. What between the smoke and the harmony, he was almost voiceless. On examination it was found that the left ventricular

bands were greatly swollen. He was given another inhalation of ipecacuanha wine, four drachms being used this time, and at once, as on the previous occasion, his voice became clearer. The next day he came again, and after another inhalation of ipecacuanha wine a still further improvement was noticed. He was given no medicine, with the exception of a purgative pill. On the 11th he was given his third inhalation, four drachms again, and on leaving he declared that his voice was nearly restored. He took great pains to inhale thoroughly, and probably much of the ipecacuanha was absorbed. The next day he was still better, but reported that the spray made him sick. He had another inhalation, and did not return till the 22nd, when he came to say that he was perfectly well and needed no further treatment. The vocal cords were examined and were found to be healthy. He was discharged cured after five inhalations."

In the next case hoarseness, depending on congestion and ulceration of the cords, was relieved by a course of the Ipecacuanha Spray :

CASE XI.—"Emma V., æt. 30, single, a children's nurse, came under observation on December 4th. She stated that she had had a cough every winter since she was a girl at school. It troubled her most at night, and frequently disturbed her rest. It usually came on in fits, and she could obtain no relief until she had expectorated a quantity of thick phlegm. She had been more or less short of breath for three years, and often experienced considerable difficulty in getting upstairs. There was a little loss of flesh in the winter, but nothing very much. She had never had sweating at night, and there was no family history of phthisis. Her general symptoms troubled her very little, but she was much alarmed at losing her voice a fortnight ago. She speaks now in a guttural tone, and evidently with considerable discomfort and distress. She attributes her symptoms partly at having to get out of bed at night to attend to the children, and partly to the fact that she has to sing to them, and also in a choir. On examining her chest she was found to have a litttle moist rhonchus at both

bases. On laryngoscopical examination it was found that there was ulceration of the right cord, with congestion of both. She was given an inhalation of ipecacuanha wine by means of the steam inhaler, and an improvement in the voice was at once apparent. The improvement, however, was only temporary, and the next day she was as bad as ever. She had eleven inhalations before there was any improvement. Sometimes she had the spray from a Richardson's apparatus and sometimes from the Siegle's, but she preferred the latter. She was kept under treatment until December 29th, by which time her voice was perfectly clear, and all her symptoms had disappeared. At her last visit the chest was examined, and was found to be free from rhonchus, whilst the laryngoscope showed that the ulceration of the vocal cord had disappeared."

I have used a Tartar Emetic Spray in a certain number of cases, chiefly with the view of comparing the results with those obtained with the Ipecacuanha Spray. I usually employ a solution of Tartar Emetic in water, one grain to the ounce.

In some cases I have used equal parts of Antimonial Wine and water, and sometimes the Antimonial Wine undiluted. I have given it sometimes with the Richardson Spray apparatus, and sometimes with the Siegle. The best results have been obtained when the expectoration has been thick and stringy, and expelled with difficulty. Sometimes it produces nausea, but this can be avoided by using the diluted solution, and limiting the quantity. It certainly has less effect on the dyspnœa than the Ipecacuanha Wine. It is a useful mode of treatment; but, on the whole, I prefer the old Ipecacuanha treatment.

The following is a simple case cured by four inhalations of Tartar Emetic, no other medicine being given:

CASE XII.—"Edward G., aged 45, is by occupation a sawyer. He works chiefly in hardwood, such as ebony and mahogany. All the men in the shop suffer more or less from the dust. Many of them die early of consumption or bronchitis. He could not wear a respirator when at work, as his mates would chaff him out of it. The

general adoption of respirators would not be beneficial, he says, as the men would live longer, and wages would be lower. He has been fortunate, and this is the first winter he has had a really bad cough. He has had it now four months, but it does not matter much, as he still keeps to his work, and can eat and drink as much as ever. He would like to get rid of it, however, for his breath is short, and he cannot get about quite freely. He has spat streaks of blood at times, but never paid much attention to it. He is not married, and has no family. He knows nothing about his parents, and has not heard of them for years. On examining the chest, it is found that there is sibilant rhonchus all over both fronts. He is to take no medicine, but is to have the Tartar Emetic Spray —one grain to the ounce of water—every morning. After the first inhalation, he reports that the cough is easier, but the shortness of breath is no better. After the second inhalation, the cough was said to be very much better, and there has has been some improvement in the breathing. After the fourth inhalation, the cough had almost

ceased, he could get about without much difficulty, and he did not see the use of wasting his time coming any more. He was given a tonic which he said he would take if he thought it necessary."

In the following case both the Tartar Emetic and the Ipecacuanha Spray were used. The result was not very satisfactory, probably in consequence of the patient's constant exposure to cold:

CASE XIII.—"J. Smith, aged 40, a fireman at Euston, stated that he had had a terrible cough every year for six or seven years, chiefly in the winter months, for he was often exposed to wet, cold, and draught for ten or twelve hours at a stretch. The fogs affected him greatly, and the smoke and steam were almost as bad. Some days his breath was so short that he could hardly get about, but he managed to stick to his work, well or ill. The phlegm was thick, and hard to get up. Two of his sisters had died of consumption, or some kind of cough. On examining the chest, sibilant rhonchus was noted all over the front, with moist sounds at the bases posteriorly. He was given an

inhalation of tartar emetic, two grains to the ounce, and he complained that it made him feel sick. He brought up a great deal of phlegm, which eased the cough. The uvula was found to be very long, and the application of glycerine of tannin eased him very much. The strength of the inhalant was reduced to one grain to the ounce, and there was no further complaint of sickness. After three inhalations, he said the cough was easier, and that the treatment had done him good. He stayed away for some days, and then returned, saying he had caught a fresh cold. The tartar emetic was used again and again, and afforded some relief. He had seven inhalations in all, when, as he was not making very marked progress, the ipecacuanha spray was substituted. This, he said, eased the breath more. He had six of the ipecacuanha inhalations, and, as there was still a good deal of rhonchus to be heard over the chest, he was well painted with iodine liniment, which afforded him material relief. He said he could not afford the time to come any more. He was discharged considerably better, but not cured."

In a few obstinate cases, in which shortness of breath has been the prominent symptom, I have employed a spray of Tincture of Lobelia with considerable success. The following case is of interest, as it illustrates the comparative benefit obtained in an obstinate case from sprays of Tartar Emetic, Ipecacuanha Wine, and Tincture of Lobelia:

CASE XIV.—"Thomas H., aged 57, has been a cab-driver for the last twenty years. He has had a cough for winters, and it is worse this year than usual. It comes on in bad fits almost every hour, night and day. The expectoration is abundant, white, and frothy. His breath is so short that he cannot lie down at night, and he has the greatest difficulty in getting upstairs. He cannot walk far, and, once on his box, he does not care to get off it. There is a good deal of emphysema, and the signs of bronchitis are well marked. He is gouty, and has had several sharp attacks. On 8th January, he had an inhalation of tartar emetic, two grains to the ounce, about four drachms being used. On the 9th, he reported that there had been no improvement, and the inhalation was repeated. On

the 11th he came again, and said he thought he had been a little better after the inhalation, but he could not say positively. It was repeated, and the next day he said he was no better. The inhalation was given on the 12th, 13th, 14th, 15th, and 16th, and there was some improvement in the cough, but the breathing was as bad as ever. These were all fine, bright, warm days, and a better result was looked for, especially as the patient was staying at home, and was not out with his cab. The inhalation was repeated on the 18th and 19th. These were cold, damp, foggy days, and the patient was so short of breath that it was determined to give him the ipecacuanha spray in place of the tartar emetic. The ipecacuanha wine was diluted with an equal quantity of water, and of this four drachms were used in the hand-ball spray apparatus. He reported that there had been an improvement, the cough was easier, and the breathing especially was less distressed. This same inhalation was given daily for a week, and the patient continued to make very satisfactory progress, except that his breath was short, and he had great

difficulty in getting about. The patient, being most anxious to get back to work again, it was determined, on the 27th, to give him lobelia spray. The simple, not the ethereal, tincture was used, and he was given 150 squeezes of the hand-ball spray apparatus. He did not seem to mind it in the least, but said it eased his breathing 'like tobacco smoke'. He coughed a good deal, and brought up more phlegm with less difficulty than he had done for a long time. On the 28th he had 200 squeezes, and, on the 29th 250, there being a very great improvement in the breathing each time. On the 1st, 2nd, 3rd, and 4th he had 260 squeezes, and seemed to be doing remarkably well, when he was seized with an attack of acute gout in the left foot and wrist. He had nothing but colchicum for a week, and then returned with the breathing nearly as bad as ever. At his own request he had the lobelia spray daily for a week, and he again improved wonderfully. He felt well enough to go back to work, and on 4th March was given some tar pills and a tonic. He came from time to time till May, when he left us

for the summer. It may be mentioned that he thought the lobelia did more good to his breathing than either of the other drugs used as sprays. He always 'felt better and easier for it'. At first it strained his chest, and he hardly felt strong enough to bear it; but, after a time, when he got used to it, it did more than anything to ease the spasm."

I have given the Lobelia Spray in a few cases of bronchial asthma with advantage. One of the patients (CASE XVI.) was a little girl of seven, who, in addition to a good deal of cough, which was more or less persistent all the year round, suffered at times from true asthmatic attacks coming on suddenly and usually at night. The bad attacks came on at uncertain intervals, and she often went a fortnight without one. The pure tincture of lobelia was used, the patient having from 200 to 250 squeezes at each visit. The treatment was commenced on 29th January, and she had no attack until 9th February. It came on as usual at night, but it lasted only an hour, and passed off more quickly than she had anticipated.

She contined the treatment until 24th March, and had only one slight attack during that time. On discontinuing the spray and substituting a tonic, the asthmatic attacks became more frequent.

The same method of treatment was adopted in the case (CASE XVIII.) of a woman aged 73, who had had shortness of breath and cough for many years. The attacks usually came on at night, and the breathing was very short after any exertion. She had been so ill for many months that she had made no attempt to go out. In her case the tincture of lobelia was diluted with twice its bulk of water, and from 150 to 250 squeezes were given daily. It is unnecessary to give details of her case in full, but she came daily from 29th January until 12th February, and during that time gradually and steadily improved, both with respect to the cough and the breathing.

As the expression "200 squeezes" conveys no definite meaning, it may be as well to explain that with the apparatus employed 100 squeezes corresponded to a drachm of fluid. Three hundred squeezes of the mixture used in the last case (1 in

3) would, of course, mean a drachm of the tincture, but it must be remembered that only a portion of this really goes into the lungs or is absorbed, much of it being deposited in and about the mouth.

The observations with the Lobelia Spray are comparatively few, and I have notes of only about twenty cases, but I am inclined to think well of it and should recommend it in cases of asthma. It will be remembered that as a rule the Ipecacuanha Spray is not suitable for cases in which the asthmatic element predominates. These are just the conditions in which the Lobelia does good.

In a few very obstinate cases of chronic bronchitis, and in three cases of phthisis, I used a spray of tincture of cantharides. The preparation I employed contained five minims to the drachm of water. It produced no irritation and seemed to do good by allaying the cough and facilitating expectoration. My experience of this mode of treatment has been so limited that I cannot take the responsibility of recommending it.

I have notes of about a dozen cases of Winter Cough in which I used Tincture of Jaborandi as a

spray. The quantity employed at each inhalation was two drachms. In some cases it caused slight salivation and perspiration. It facilated expectoration, but I am satisfied that the results obtained were not equal to those which followed the administration of the Ipecacuanha Spray. A great disadvantage was that the Jaborandi stained the face, and although the stains washed off after a time it was not pleasant for the patient. An old gentleman who came with a long snow-white beard went away with one of a bright green colour. He did not notice it, but his friends did.

Another spray which I sometimes used in bronchial catarrh is a solution of Iodide of Potassium. It is well known that this drug is a useful addition to the ordinary chloride of ammonium expectorant mixture. For spraying I employ a two per cent. aqueous solution. The results have been perfectly satisfactory in every way, and in many cases there has been prompt relief to the dyspnœa. In a paper on " Paroxysmal Sneezing " by Dr. Ringer and myself (*British Medical Journal*, June 16 and 23, 1888), we related the case of a

gentleman who always suffered from a peculiar itching at the back of the throat from taking iodide of potassium. He experienced the same symptoms from the use of a largely advertised remedy known as "Spirone". Acting on this hint, we had it analysed, and found that it was practically a two per cent. solution of iodide of potassium mixed with glycerine and acetone. Many cases in which I have employed iodide of potassium as a spray I have painted the chest with iodine. I prefer the liniment, taking care to apply it not only over the chest in front, but to the back as well. It smarts, of course, but it does good. It probably acts in two ways, first as a counter-irritant and then as an inhalation, the iodine, which is volatilised by the heat of the body, being inhaled in small quantities through the respiratory passages. It is a good accessory mode of treatment, and does not preclude the use of other remedies.

CHAPTER III.

TAR AND ITS ALLIES.

THE literature of Tar as a remedial agent is extensive and exhaustive. The works of Axtius and of Roberg, which appeared respectively in 1679 and 1718, call for but a passing notice. The most solid contribution to the subject is the remarkable work by the Right Rev. Dr. George Berkeley, Lord Bishop of Cloyne, and author of the *Minute Philosopher*, which he entitled *Siris: a Chain of Philosophical Reflections and Inquiries concerning the Virtues of Tar Water and divers other Subjects connected together and arising one from another.* The first edition was published in 1744, and the second edition, "improved and corrected by the author," in, I think, the following year, although it bears no date on the title-page. It appeared first in Dublin, was reprinted in London, and was subsequently translated into French, German, Dutch, Swedish, and other languages. It created some sensation at the time, and gave rise to a great

many other works on the same subject. It covers 176 closely-printed pages, and is divided into 368 sections. Copies of it are rare, but it is still occasionally to be met with on second-hand bookstalls both in London and Paris. The learned writer says: "In certain parts of America tar water is made by putting a quart of cold water to a quart of tar and stirring them well together in a vessel which is left standing till the tar sinks to the bottom. A glass of clear water being poured off for a draught is replaced by the same quantity of fresh water, the vessel being shaken and left to stand as before. And this is repeated for every glass so long as the tar continues to impregnate the water sufficiently, which will appear by the smell and the taste. But as this method produceth tar water of different degrees of strength, I choose to make it in the following manner: Pour a gallon of cold water on a quart of tar and stir and mix them thoroughly with a ladle or flat stick for the space o three or four minutes, after which the vessel must stand eight-and-forty hours, that the tar may have time to subside, when the clear water is to be poured

off and kept for use, no more being made from the same tar, which may still serve for common purposes." The author, after referring to its supposed virtues as a preventative of small-pox, continues: "Having tried it in a great variety of cases, I found it succeed beyond my hopes, in a tedious and painful ulceration of the bowels, in a consumptive cough (as appeared by expectorated pus), an ulcer of the lungs; in a pleurisy and peripneumony. And when a person, who for some years had been subject to erysipelatous fevers, perceived the usual forerunning symptoms to come on, I advised her to drink tar water, which prevented the erysipelas. I never knew anything so good for the stomach as tar water; it cures indigestion and gives a good appetite. It is an excellent medicine in an asthma. It imparts a kindly warmth and quick circulation to the juices without heating, and is therefore useful not only as a pectoral and balsamic, but also as a powerful and safe debstruent in cachetic and hysteric cases. As it is both healing and diuretic, it is very good for the gravel. I believe it to be of great use in a dropsy, having known it cure a very bad anasarca

in a person whose thirst, though very extraordinary, was in a short time removed by drinking of tar water."

This paper, by the author of the *Minute Philosopher*, was followed by a number of pamphlets in reply to it, the best known being *Anti-Siris, or English Wisdom Exemplify'd by various Examples, but particularly the present General Demand for Tar Water, on so unexceptional authority as that of a R——t R——d Itenerant Schemist and Graduate in Divinity and Metapisicks. In a letter from a Foreign Gentlemen in London to his Friend abroad;* and *A Cure for the Epidemical Madness of Drinking Tar Water from Ireland, by a certain R——t R——d Doctor in a letter to his L —— P. By T. R. (? Thomas Reeve), M.D.* This second production is usually attributed to Dr. Thomas Reeve, and is well worth reading. Bishop Berkeley in 1787 published *Two Letters on the Usefulness of Tar Water in the Plague*, and this was followed some five years later by *Further Thoughts on Tar Water*. Amongst other works which appeared about the same time may be

mentioned Hale's *Account of some Experiments and Observations on Tar Water*, and the *Programma quo infusum Picis liquidæ aquosum declaratur* of Qualmalz.

In 1823 Sir Alexander Crichton published a work entitled *Practical Observations on the Treatment and Cure of Several Varieties of Pulmonary Consumption, and on the Effects of the Vapour of Boiling Tar in that Disease*, in which he details some wonderfully good results obtained by treating patients suffering from pulmonary affections in "Tar Chambers". His directions for treatment are precise, and he points out that "tar as it comes to market is generally found to be contaminated with more or less pyroligneous acid, which fluid being very volatile is disengaged long before the tar boils, and as it is irritating or hurtful to the lungs must be got rid of or be arrested. For this reason the tar, before being brought into the bedroom of the sick, ought to be boiled for a few minutes in the open air, and then to every pound of it ought to be added from one to two ounces of the subcarbonate of potash." He says: "The simplest way of charging

the apartment with the tar vapour is to put a pint or upwards of the prepared tar into any flat dish or iron, copper or earthenware. This is to be placed on a stand about a foot from the ground so as to admit a suitable lamp under it. This apparatus must not be placed too near the patient at first, because it is impossible to say beforehand how it may affect him, and in what degree of force he can bear it. In whatever part of the apartment it is placed the air is soon charged with the vapour." He adds that "the tar to be employed ought always to be chosen as liquid as possible, and consequently the thick resinous part at the bottom of the casks ought to be rejected".

In 1860 Sales-Girons published a work of some five hundred pages, entitled *Traitment de la Phthisie Pulmonaire par l'inhalation des liquides pulvérisés et par les fumigatious de Goudron*, in which a similar mode of treating chronic bronchitic affections is advocated. The results seem to have here undoubtedly the germ of the antiseptic method of treating consumption which of late years has been employed with so much advantage.

In March, 1875, a paper "On the Value of Tar in Bronchial Catarrh and Winter Cough," by Dr. Ringer and myself, appeared in the *British Medical Journal*. We were induced to make an investigation of this mode of treatment, partly from the account of its efficacy which we had seen in the works already referred to, and partly from the description of its effects given us by patients who had lived in France and Belgium. People so susceptible to cold that they were obliged to remain indoors the whole winter told us that this remedy curtailed considerably the duration and lessened the severity of their catarrhal attacks, and that by an occasional recourse to the tar they became less prone to catch cold, and could more freely expose themselves to the weather without incurring an attack. Our observations serve to confirm these statements.

We gave the tar in two-grain doses, made into pills, every three or four hours. We carefully watched its effects on twenty-five patients whose ages ranged from 34 to 70, the average being 44. All these patients had suffered for several years

from Winter Cough, lasting the whole winter. They were all out-patients, and came to the hospital either once or twice a week. Most of them were much exposed to the weather, whilst some were so ill that they were obliged to give up their work, and were consequently less exposed. These patients suffered from the symptoms common in Winter Cough—paroxysmal and violent cough—the paroxysms lasting from two to ten minutes, and recurring ten to twelve times a day, and also at night, breaking their rest. The expectoration, frothy and slightly purulent, was generally rather abundant, amounting in some cases to half-a-pint or more in the day. The breathing was very short on exertion, but most of them could lie down at night without being propped up. The physical signs showed a variable amount of emphysema, with sonorous and sibilant rhonchus, and occasionally a little bubbling rhonchus at the base. These patients usually began to improve from the fourth to the seventh day, the improvement rapidly increased, and in about three weeks many of them were well enough to cease attending. The

improvement was in many cases so decided that the patients returned to their work,—even those who in previous years had been confined to the house the whole winter. The cough and expectoration improved before the breathing. In several cases the expectoration increased during the first three or four days, but it was expelled more readily; and, with the improvement in the cough and expectoration, strength and appetite returned. On discontinuing the tar, a relapse often occurred in a week or two, and the patients returned with a request for some more of the same medicine; and then a second time the symptoms quickly subsided. We found it of little value in bronchial asthma, and its effects were more evident in cases where the expectoration and cough were more troublesome than the dyspnœa. We came to the conclusion that tar administered in this way was a good, useful, though perhaps not a striking remedy for these bronchitic affections, and that it was certainly more efficacious than the drugs usually employed.

This communication excited a good deal of

comment; and in the following May, in consequence of the numerous inquiries we received respecting the best method of administering the drug, I published a supplementary article on the subject. It was pointed out that the drug used was not pitch, as many of our correspondents had supposed, but the wood tar, the *Pix liquida* of the British and United States Pharmacopœias, prepared from the wood of *Pinus sylvestris*, the Scotch fir, and other pines, by destructive distillation. In America the *Pinus palustris* of the Southern States is preferred; but that is a mere matter of detail. The wood is cut into billets of a convenient size, which are heaped up so as to form a large stack or pile, and then covered with earth, as in the process of making charcoal. The stack is built up upon a small circular mound of earth, higher at the circumference than in the centre, where there is a hole communicating by a conduit or outlet with a shallow ditch surrounding the mound. A light is applied at the top, and the whole mass is allowed to burn slowly, so that the resinous matter is melted out of it by the heat. The tar runs into

the hole in the centre of the mound, and passes along the conduit into the ditch, from which it is transferred to barrels. Immense quantities are made in North Carolina and Virginia: enough to tar all the rails in the States, and cure the coughs of the world besides.

At first our pills were made with Massa Panis, prepared as follows: "Wheaten flour, one part; glycerine, five parts, by weight: mix and heat together until a jelly is formed; when cold, add six parts of wheaten flour, and beat well together". This, although a good formula for many pills, does not answer well for tar. We next tried mixing the two grains of tar by means of gently heating with a grain of wax and two grains of powdered liquorice root. This was more satisfactory, but the difficulty was that these pills could not be coated, as the spirit used in the process dissolved out the tar. Subsequently, the pills were made by a much simpler method: by mixing with the tar half its weight of lycopodium, the sporules of *Lycopodium clavatum*, and other allied species.

For some years, however, I have prescribed tar

in the form of perles or capsules. The perles contain from two to three grains in each, and two may be taken as a dose. The large capsules hold from four to five grains, although they vary somewhat in size. There are several other preparations containing this drug, which are largely used on the Continent, and might perhaps with advantage be introduced into this country. For example, the *Dragées de Christiania au Goudron de Norvège* are elegant little bon-bons, each containing five grains.

The worst of these elegant preparations is that they are too expensive to use in hospital practice. For a long time I could find no good way of giving tar—no method, that is to say, that exactly suited my requirements—but at last I thought of the syrup of tar of the United States Pharmacopœia, and for the last two years I have used very little else. I published the formula in the *British Medical Journal* of March 3, 1888. It is as follows:

"Tar, three ounces; cold water, five ounces; boiling distilled water, twenty ounces; sugar, in coarse powder, twenty-eight ounces. These are the quantities required to make two pints. The

cold water is poured on the tar, and it is shaken up frequently for twenty-four hours, and then the water is thrown away. The boiling water is then thrown on the washed tar, and the mixture is stirred briskly for fifteen minutes, after which it is allowed to stand, with occasional stirring, for thirty-six hours. The solution is then decanted and filtered. Finally, in seventeen ounces of the tar water dissolve the sugar, and mix it all up together."

This seems a somewhat complex process, but the directions should be strictly followed. The preliminary washing with cold water is absolutely necessary, as it gets rid of the acid principles which would prove irritating. It is a most inexpensive medicine, costing practically nothing but the trouble of making. It is prescribed as Syrupus Picis Liquidæ or Sirop de Goudron. It is generally said to contain four per cent. of tar, but Mr. Tanner, the Dispenser at the Westminster Hospital, tells me that it is very difficult to say exactly how much there is taken up, as, from the addition of the water, the tar weighs after the process almost

as much as it did before. He finds, however, that, by the addition of a few drops of some alkali—such as ammonia, for example, which is rather beneficial than otherwise—he can make it of almost any desired strength. It is probably not a simple body, but contains xylol, cresol, pseudocumol, chrysene, retene, methylcreasol, and other substances, the names of which cannot be pronounced without danger to the health. The great point about it is that it is palatable, and that it is taken by patients, who have no misgiving as to its composition, without difficulty. I usually give it in two teaspoonful doses, in a little water, four times a day; or, better still, a couple of teaspoonfuls may be taken as a cough linctus any time, night or day, when the cough is troublesome. Of course, there are always people who are fastidious, and object to the taste of any medicine. In the case of these hypercritical individuals, I mix it with a little syrup of wild cherry, made as follows:

Wild cherry bark in fine powder, five and a half ounces; sugar in coarse powder, twenty-eight ounces; glycerine, two ounces; water, a sufficient

quantity to make two pints. The wild cherry is thoroughly moistened with water and macerated for twenty-four hours in a closed vessel. It is then packed firmly in a cylindrical glass percolator, and water is gradually poured upon it until fifteen fluid ounces of percolate is obtained. The sugar is then dissolved in the liquid by agitation without heat, the glycerine is added, and the process is complete.

A mixture of two parts of syrup of tar and one part of syrup of Virginian prune is an ideal mixture. In its presence maraschino, curaçoa, and even green chartreuse naturally take a back seat. I cannot say more in favour of a cough medicine, except that its effects are really marvellous and that the chronic bronchitic who has once tasted it yearns for it. This is no hypothetical statement, for during the last two years I have prescribed it for over a hundred patients. Sometimes in very bad cases I ordered two pills containing two grains of tar in each to be taken every three hours with a tablespoonful of the syrup to follow as a relish. I see no objection to the addition of

three minims of liquor morphinæ acetatis to each dose of the syrup when the cough is very troublesome, or even of ten drops of tinctura camphoræ composita. When expectoration is difficult the addition of a little apomorphine will be found most useful. I use the two per cent. solution of the British Pharmacopœia, the injectio apomorphinæ hypodermica, as it is called. It is perhaps unnecessary to say that it need not be freshly prepared, and that the change of colour which it undergoes on keeping is of not the slightest importance. I find that six minims may be given frequently without exciting nausea, and that many patients take ten without difficulty. It is a wonderful expectorant and its beneficial effects are far too rarely evoked in this country.

I have notes of a large number of cases which have been treated with tar—notes which have accumulated little by little during the last ten years, but nothing would be gained by reproducing them in detail, and it will suffice if I mention some half-dozen which serve to illustrate points of interest.

The first is a simple uncomplicated case of no great duration in which a cure was soon effected :

CASE I.—"Harriet H., aged 47, keeps house for her husband, but was formerly in the greengrocery line, and for the best part of her life served in an open shop. She had suffered from a bad cough for five or six years, but this winter it is worse than ever. It comes on in sevère paroxysms, a dozen or more in the day, each lasting ten minutes or longer. It is always increased by fog or smoke, and her husband has to go out into the back yard if he wants to smoke when he comes home. The expectoration is profuse, white, and frothy. There has never been any hæmoptysis. Her breath is short, and she has much difficulty in getting up stairs. On examining the chest it was found that there was bubbling rhonchus at the bases of both lungs. On January 8th the patient was ordered two two-grain tar pills, to be taken every four hours. On the 15th she reported that she was much better, and that the paroxysms of cough were less frequent and of shorter duration. On the 22nd she stated that the breathing was better, thanks to

the pills, and she had improved in every way. On the 29th the cough had left her and the expectoration had ceased. She was given a tonic and ceased attending."

The next is an exceptionally obstinate case in which the tar had to be taken without intermission for two months :

CASE II.—"Sophia H. came to the hospital complaining that she had had a cough for fourteen years. It always came on early in November and lasted until the summer was well advanced. The fits of coughing were very severe,and she had them almost every hour. There was always a good deal of expectoration, sometimes watery and sometimes yellow and thick, so as to necessitate the use of three or four pocket handkerchiefs both night and day. There was great shortness of breath, and the patient had difficulty in walking even half-a-mile. It was impossible for her to get upstairs, so that she was obliged to have a bedroom on the ground floor. She complained that she had no appetite, and that she felt low-spirited, weak, and ill. Her father and mother had both died of consumption,

and all her brothers and sisters suffered from winter cough. On examining the chest it was found that the percussion note was poor, and that the movements were impaired, but there was no actual proof of the existence of consumption. On November 13 she was ordered two grains of tar in a pill, to be taken every four hours. On the 20th she reported that the cough was easier and that she had slept better. On the 24th the expectoration was less, and the breathing was easier. On the 27th she caught a fresh cold from incautious exposure to night air and fog, and there was a relapse. On December 1st she was better again, and volunteered the statement that the pills greatly relieved the urgent symptoms. During the whole of this month she continued steadily with the treatment, and on January 11th it was found that she was almost free from cough, and that the expectoration had practically ceased, and that the breathing was quite as easy as it was in the summer. She was then given cod liver oil and hypophosphite of lime, and was discharged cured."

The following is a good case in a bad subject:

CASE III.—"John R., aged 66, a wheelwright, has had a cough in the winter for many years. He has had a very bad attack of it this year and expectorates a great deal of thick yellow phlegm. His breath is very bad; he roars, he says, like a bull going upstairs; and he cannot lie down at night, but has to sit up in an arm-chair. He cannot work, and for the matter of that has not done much for some years. His appetite is bad, but he can drink as well as ever, and does not care much what he takes if he can get it. He knows nothing about his family history, and never heard that he had any parents. He never had any previous illness, and never met with any accident except being locked up by the police. He is found to have sibilant rhonchus all over the front of the chest, with moist râles at the bases, but objects to the examination on principle as he cannot see the use of it. His arteries are degenerated and he has a marked arcus senilis. He is not a favourable subject for treatment, and it is doubtful if he will take any medicine. He is ordered two grains of tar in a pill four times a day, and at the expiration of a week returns and says he is

no better and does not expect to be. The tar is repeated, and a week later he reluctantly confesses that his cough is easier, that he expectorates less, and that he can lie down at night without being troubled with the shortness of breath. He takes the pills for a fortnight longer, and then complains that he is so much better that if he goes on improving at the same rate he will be taken off his club and have to go to work again. The only good point about the pills, he says, is that they don't impair the powers of drinking. He is discharged evidently greatly dissatisfied with the treatment."

The following is a case of Winter Cough treated with syrup of tar and apomorphine given in steadily increased doses:

CASE IV.—"Daniel M., aged 46, a carpenter, came to the Westminster Hospital on November 25th complaining of winter cough, from which he stated that he had suffered many years. It always came on early in November, and lasted the winter through. It troubled him more or less all day, but was worse at night. His expectoration was thick, copious, and tenacious.

He was so short of breath that he was quite unable to work. The physical signs were those of emphysema, with moist rhonchus at the bases of both lungs. He was ordered a mixture of senega and ammonia, which did him little or no good. On December 14th the prescription was changed to syrup of tar, two drachms every four hours, and there was an immediate improvement, especially as regards the cough. On December 21st the dose of the tar was increased to four drachms, with three drops of the apomorphine solution in each dose. The improvement was still more marked, and the patient expectorated with much less fatigue or difficulty. He was instructed to take the medicine every alternate hour, and this he did without inconvenience. On January 25th the dose of apomorphine was increased to five minims, and on February 8th to eight minims, the frequency of administration remaining the same. The symptoms were at once alleviated, and a week later the patient was discharged, practically cured."

In the following case, which threatened to prove

obstinate, the Tar pills and Ipecacuanha Spray were used concurrently :

CASE V.—" William B., aged 44, a bricklayer, states that he has had a cough from his birth, chiefly in winter, and that it gets worse every year as he grows older. It comes on in regular fits ten or twelve times, which take his breath away and prevent him from doing anything. The expectoration is frothy, and he spits up a pint or more during the night and day. His breath is always short, and he wheezes so much that neither he nor his wife can sleep at night. He can't lie down, and often feels as if he must be choked. He is always worse after meals, and the breath is especially short when the bowels are confined. On examining the chest, it is found that there is sibilant rhonchus all over both back and front, and there is dulness at the right apex, but without crepitation. He states that his father and one sister died of consumption, and that his mother, who is now 70, has been asthmatic for many years. He is ordered a pill containing three grains of calomel, with a little extract of hyoscyamus, to

take every three hours, and he is instructed to come every morning to have the ipecacuanha spray. The treatment is carried out strictly, and at the expiration of ten days he reports that nearly all his symptoms have left him and that he is better than he has been in the winter for years. On examining the chest, it is found that the sibilant rhonchus has gone, and that the only sign of mischief is the dulness at the right apex. He is ordered some extract of malt and a mixture of hypophosphites of lime and soda, and a fortnight later he is discharged well."

In the following case the Tar cured not only the Winter Cough, but Psoriasis, from which the patient had suffered for many years:

CASE VI.—"Henry B., aged 66, a tin-plate worker, came to the hospital complaining of a cough, which he stated had troubled him every winter for six years. The paroxyms were very violent, and he had as many as twenty in a day, each lasting five minutes or more. He expectorated freely, the phlegm being sometimes frothy, and at others thick and yellow. He said he was

very short of breath, and had often to stop a dozen times in walking a mile. He attributed his illness to working in a hot shop and then standing in a draught to get cool, a custom which he had followed for many years. He had lost flesh considerably ; and, on examination, it was found that there was large bubbling rhonchus all over both sides of the chest and back. His arms and legs were almost covered with large patches of psoriasis, from which he had suffered for nearly ten years. He was obviously a good subject for the tar treatment, and he was ordered two two-grain tar pills every three hours to be taken for a fortnight. At the expiration of that time he returned and said that both the cough and the rash were completely cured."

The next is a very exceptional case, which is mentioned rather as a clinical curiosity than from any direct bearing on the case :

CASE VII.—"F. H., a cabinetmaker, aged 47, came to the hospital on December 1st complaining of cough, from which he had suffered on and off for about two months. He stated that he had had it

four winters, but was always well during the summer. The cough was paroxysmal, and he usually had two attacks during the night and a dozen or more during the day. The paroxysms were violent, and usually lasted from three to five minutes. There was a great deal of white frothy expectoration, which he expelled without difficulty. His breathing was short, and at times he could hardly get about. He had never spat blood, and there was no consumption in the family. His chest was carefully examined, but nothing wrong was detected. His urine was free from albumen. He stated—and this was the peculiar feature of his case—that after a severe attack of cough he frequently lost consciousness for some minutes. He fell down, he said, quite insensible, and had been told that he was convulsed. The fits came on at various intervals, sometimes only once or twice in five or six days. They never occurred after a violent paroxysm of cough, but they were always preceded by a little cough. His memory, he pleaded, was very bad, and he might not be strictly accurate in his statements. Considerable doubt was experi-

enced as to the nature of the fits, but the most probable explanation seemed to be that he was an epileptic. He was given bromide of potassium, which he took for ten days, but without benefit, the attacks being as frequent as ever. He was kept under observation as much as was possible in the case of an out-patient, but he was never seen in one of his attacks. There was no reason to think that he was intentionally misleading us, although it must be admitted that the circumstances were suspicious. He was ordered two grains of tar every three hours, with occasionally the ipecacuanha spray. As his cough improved, the fits became less frequent. He came twice a week for about two months, and careful notes were taken at each visit. The records are voluminous; but as considerable doubt existed as to the exact nature of his case, it is unnecessary to reproduce them in detail. The following summary will give some idea as to his progress:

TAKING TAR.

From December 11th to 14th, or 3 days .	.	3 or 4 fits.
„ „ 14th to 21st, or 7 days .	.	2 or 3 fits.
„ „ 21st to 29th, or 8 days .	.	no fit.

TREATMENT DISCONTINUED.

From December 29th to January 4th, or 6 days . 6 fits.

TAR RESUMED.

From January 4th to 6th, or 2 days . . . 9 fits.
,, ,, 6th to 14th, or 8 days . . . 4 fits.
,, ,, 14th to 20th, or 6 days . . . no fit.
,, ,, 20th to 25th, or 5 days . . . 2 fits.
,, ,, 25th to February 2nd, or 8 days . 1 fit (slight).

His cough was then cured, the expectoration had ceased, and the breathing was easier. He was seen at intervals, but stated that there had been no return of the fits. It must be admitted that the whole case is open to considerable suspicion, and it is doubtful if much reliance can be placed on his statements. The curious circumstance was that he never had a fit at the hospital. He stated that he had had these attacks in previous winters when he was troubled with the cough, but never in the summer."

Tar, although a good remedy for Winter Cough, is somewhat slower in its action than the Ipecacuanha Spray. When shortness of breath is the prominent symptom the spray is clearly indicated, but if the cough is the predominant feature re-

course may be had to the tar. The Tar treatment, of course, involves much less trouble than the spray treatment. There is no reason why they should not be combined. The tar pills may be taken three times a day, when the patient is out and about, and the Ipecacuanha Spray used night and morning. It is somewhat difficult to give the Ipecacuanha Spray to children, but they take syrup of tar in unlimited quantities without difficulty.

In the United States a wine of tar is made according to the following formula :

" Tar, 8 fluid ounces ; lager beer, 8 pints ; alcohol, 8 fluid ounces. Boil the tar with the beer for fifteen minutes, allow it to cool, add the alcohol, and filter."

I am assured that gallons and gallons of this mixture are sold every winter, and that there is a constant demand for it all over the States. I have tasted it, but I cannot say I like it. I have no doubt that it is useful, and that in country districts it would be readily taken when perhaps more expensive preparations might not be appreciated. A more palatable preparation is made by allowing

extract of malt to ferment in contact with tar; the alcohol acts as a solvent, whilst the extract of malt serves to sweeten the solution. Recently my attention has been called to an American medicine called Blount's "Aromatic Oil of Tar". It is palatable, and undoubtedly does good in many cases. Mr. Tanner finds that a similar preparation may be made by mixing tar with rum and a little treacle. It gives excellent results when administered freely.

Allied in general action to tar is creasote. I have used it, not systematically, but from time to time, in a great number of cases of chronic bronchitis. I usually prescribe it in the form of a mixture, containing one minim of creasote, two of laudanum, fifteen of chloric ether, glycerine a drachm, and water to an ounce. This is given three or four times a day, according to the severity of the symptoms. I occasionally employ it in the form of a linctus made up with glycerine, and containing one drop of the creasote in the dose. If given frequently it eases the cough and facilitates expectoration. I usually resort to creasote

when the patient complains of vomiting in addition to the other symptoms.

In connection with this subject I may mention that benzol is an excellent expectorant, and is a very useful remedy in the treatment of chronic bronchitis. It was originally made by distilling benzoic acid with lime, and was subsequently discovered by Faraday as a constituent of coal-gas tar. It is now obtained and purified by a somewhat complex method, which will be found described in most of the text-books on chemistry. It is a colourless, oily fluid, possessing an odour which to most people is not disagreeable. The formula I employ is the following:

Pure benzol . . .	1½ drachm.
Oil of peppermint . .	½ „
Olive oil to . . .	2 ounces.

The dose is from ten to thirty drops on sugar frequently. I have treated many cases of chronic bronchitis in this way, and the results have been very satisfactory. The dose of the rectified benzol may be increased if thought desirable.

The following is a brief note of a case of chronic

bronchitis treated with benzol, and recently under observation :

CASE VIII.—" Emma N., aged 42, is a shirt-sewer by occupation. She is overworked and badly fed, and has had a cough more or less, both winter and summer, for the last five or six years. It is worse at night, and frequently she gets hardly any sleep. The expectoration is scanty, and is often streaked with blood. There is great shortness of breath, and the patient has much difficulty in getting about. She is losing flesh a little, but not to a very notable extent. On examining the chest it was found that there was loud bubbling rhonchus all over both back and front. She was ordered ten drops of the benzol mixture on sugar every four hours, and a week later she reported that she was much better. The treatment was continued for a fortnight longer, and the cough had then almost disappeared ; but there was still very great shortness of breath on exertion."

CHAPTER IV.

PURE TEREBENE AND ITS ALLIES.

THE next subject investigated was Pure Terebene. It is a clear, colourless fluid, having an aromatic odour, and it is made by the action of sulphuric acid on oil of turpentine and subsequent distillation. My observations with this drug were commenced in 1880, and in a lecture delivered at the Westminster Hospital I gave an account of the "Influence of Pure Terebene on Fermentation". It is not pretended that the experiments are complete or exhaustive, but they served my purpose, and put me in possession of certain information which I was anxious to obtain before making a clinical trial of what I hoped would be a valuable remedy.

I took two beakers of the same size and shape, and in each of them placed 265 cubic centimetres of water and a little hay. To one of them I added half-a-cubic centimetre of Pure Terebene. Both beakers were covered with glass plates, and placed in a warm chamber at 36° C. (96·8° Fahr.). Two days

later the test beaker was examined, and the fluid was found to be swarming with moving particles, so minute that they could with difficulty be seen with a Zeiss D. The other beaker smelt strongly of Pure Terebene, but nothing moving could be detected when examined with the same lens. On the ninth day from the commencement of the observation the hay infusion was turbid ; a film had formed on the surface, and the fluid was distinctly offensive. Under the Zeiss D numerous monads were seen, with large numbers of moving organisms. The other beaker was clear ; there was no film on the surface, the slight sweet smell of Pure Terebene was still perceptible, and moving organisms and monads were absent. On the eleventh day the temperature of the warm chamber was somewhat higher, having risen to 40° C. (104° Fahr.). The specimens being again examined under the Zeiss and a Ross's eighth, the field of No. 1 was found to be covered with moving organisms, but in No. 2 nothing was to be seen on most careful examination. The test is a rough one, but it is clear that a two per cent. solution of

Pure Terebene will arrest fermentation in hay infusions.

On a subsequent occasion the experiment was repeated with one part in a thousand of Pure Terebene, the infusion being kept at this time at a temperature of 20° C. (68° Fahr.). In fifty-one hours the test solution, examined with a one-twelfth Ross's objective, was found to contain hay bacilli in large quantities in motion, and also numerous paramæcia. The solution with the Terebene was not absolutely free from moving organisms, but they were fewer and less developed, and no paramæcia were found. At the expiration of seventy-five hours No. 1 was seen to be swarming with paramæcia and hay bacilli, breaking up into spores; No. 2 contained only a few moving organisms, and no paramæcia. Two days later No. 2 was swarming with paramæcia, whilst they had all disappeared from No. 1.

The influence of Pure Terebene on paramæcia was demonstrated in another way. A specimen of hay infusion swarming with paramæcia was put under the microscope and examined with a Ross's

twelfth. Several large specimens being under observation, a drop of Pure Terebene was placed at the edge of the cover glass, and drawn through with blotting paper. The paramæcia were at first but little affected, but after a time their movements almost ceased, although their cilia could still be seen languidly beating. A drop of water was then drawn through, and almost immediately the paramæcia became as active in their movements as ever.

Pure Terebene has the power of arresting or preventing the fermentation of yeast. Two small bottles of identical size and shape were filled with a mixture of saccharine urine and yeast. To one bottle was added Pure Terebene in the proportion of one to four hundred and fifty. The bottles were inverted in the ordinary way in a flat vessel containing water, and placed in the warm chamber. In forty-eight hours fermentation had taken place in one bottle, and all the fluid had been driven out, while the bottle to which the Pure Terebene had been added remained full. On the third day a few small bubbles of gas appeared in it, and on the

seventeenth day it contained only about one-fourth gas. The effect of Pure Terebene in this experiment was very marked. On another occasion two bottles were taken, each holding 6½ ounces. In each was placed half-an-ounce of cane-sugar syrup, mixed with a little yeast. One was filled with water, the other with water containing 1 in 1000 of Pure Terebene, and both were inverted in shallow dishes containing water, and placed in a warm chamber. The bottles were observed day by day for six days, and the carbonic acid gas was found to accumulate twice as quickly in the former as in the latter. On another occasion, two specimens were treated in a similar manner; and, at the expiration of fifty-one hours, both were examined microscopically. There was not much difference in the character of the torulæ, but those in the bottle containing the Pure Terebene were less developed.

Pure Terebene undoubtedly exerts an influence on lactic acid fermentation. Two beakers were taken, each containing 250 cubic centimetres of

fresh milk. To one of them was added five cubic centimetres of Pure Terebene, and both were placed in a warm chamber at a temperature of 40° C. (107·6 Fahr.). At the expiration of twenty-four hours they were examined. The milk in one was found to be curdled and strongly acid. That in the beaker containing Pure Terebene had a slight film on the surface, but was quite fresh, and was neutral in reaction. It was sweet and pleasant to the taste, the only odour perceived being that of the Pure Terebene, the greater part of which was found floating at the top. Twenty-three hours later this milk was curdled, and had strong acid reaction.

These observations led to a trial of the drug in cases of irregular fermentation in the stomach, acidity, flatulence, &c., and its subsequent introduction as a remedy for Winter Cough. The results of the clinical trials were not published until an interval of five years had been allowed to elapse, so that they might be amply confirmed.

In the *British Medical Journal*, of 12th December, 1885, I published a paper on "Pure Terebene

in the Treatment of Winter Cough," giving the results of 114 cases treated with this drug. It was administered in doses of ten drops three times a day; and, in addition, it was sometimes employed as an inhalation, either a spray apparatus or an atomiser being employed. The following is a fair average case taken quite at random:

CASE I.—"R. N., aged 43, a commercial traveller, had been subject to cough every winter for twelve years. His work, he said, was against him, and he was a good deal exposed to wet and cold and the inclemency of the weather. His cough used to trouble him badly only in the winter, but year by year it seemed to be coming on earlier, and now he was hardly ever free from it. It came on in fits, which shook him to pieces, and it was always very bad the first thing in the morning, often making him retch and vomit. There was a great deal of phlegm, thick and yellow, when he was in the country, but speckled all over with black when he was in London. It was difficult to get up unless he could get some hot tea, or something to loosen it. The shortness of breath was

worse than all, for it prevented him from going about, and interfered with his business. He had never spat any blood worth speaking of, but there were at times streaks after a severe bout of coughing. He was not getting thinner, on the whole, but generally lost a little flesh in the winter, and picked up again in the summer. He had had a great deal of treatment, and mixtures, lozenges, and liniments without end. On examining the chest, it was found to be emphysematous, and there was loud bubbling rhonchus at the base of each lung. On 1st November he was ordered ten drops of Pure Terebene on a piece of sugar every four hours. Three days later, he returned, and said there had been a marked improvement; the cough was easier, the phlegm was lighter in colour, and not so thick, and the breathing was decidedly better. The dose was increased to twenty minims every four hours, and a week later the patient wrote to say that he was better, and was almost able to do without the medicine. I saw nothing of him again until 6th January, when, being in town, he came to see me. There had

been some return of the old symptoms, and he was anxious for further treatment. I ordered him a small spray diffuser, holding about an ounce, and told him to use it with the Pure Terebene as an inhalation several times a day. A fortnight later he wrote saying he had bought a larger apparatus, and that his complaint was more amenable to treatment than it had been before. The terebene spray eased the cough, brought up the phlegm, and, above all, relieved the shortness of breath. On his long railway journeys, when he was unable to use the spray without inconvenience to his fellow-travellers, he rubbed the pure terebene on his moustache and beard, so that it might slowly diffuse, and, as he said, 'soften the atmosphere'."

One of the advantages of Pure Terebene is that it is not a bulky medicine. An ounce bottle is easily carried in the pocket, is always ready for use, and will last for days. It is best to begin with five or six drops on sugar every four hours, and gradually increase the dose to twenty minims. This, for most people, is the maximum quantity, but the drug has little or no toxic action, and one

patient was so enraptured with his remedy that he insisted on taking a teaspoonful every four hours for a week. The only disadvantage I have ever noticed in it is that it gives a peculiar and characteristic odour of violets to the urine, a circumstance which patients never fail to mention. It has been said, exceptionally, to produce a rash on the skin, but that may be taken as an indication that it is not pure, and that it is contaminated with turpentine. When used as a spray, from one to two ounces should be diffused, and inhaled every week. In some instances, I have tried giving it mixed with an equal quantity of olive oil, flavoured with oil of peppermint. In twenty-five cases I gave it as an emulsion made by mixing it with a little tragacanth powder, adding water and shaking well. Each ounce of the emulsion contained a drachm, and it was usually given in half-ounce doses four times a day. The results were excellent, but not better than with the simple drug, and I saw no reason for continuing the use of a more expensive preparation. The same remarks apply to the various lozenges, capsules, and other forms

for the administration of Pure Terebene, now so extensively sold. In every case of Winter Cough in which the Pure Terebene spray was used systematically there was a marked improvement. In many instances it was noticed almost immediately, but in other cases, especially the very chronic ones, the patient had to continue his remedy for some weeks. Even when there was marked emphysema with little movement of the chest walls, some benefit was experienced.

I treated eighteen cases of phthisis by the same method, and the results were certainly most encouraging. It did most good when there was old consolidation, when no active mischief was in progress, and especially when there was no elevation of temperature. I have also used it as a dry antiseptic inhalation on the cotton wool of a respirator in phthisis, and have been much pleased with the results. In one case, that of a young lady, the respirator—a zinc one, which cost only sixpence—was worn almost continuously night and day for nine months, and the right lung, which was breaking down, cleared up, the temperature be-

coming normal, and the cough and other symptoms subsiding. Pure Terebene, used as an inhalation, is also useful in checking hæmorrhage from the lungs.

Many sufferers from Winter Cough also complain of acidity and flatulence. I soon found that Pure Terebene given internally was an excellent remedy for this combination of symptoms. It checks the formation of flatus so quickly, and is so efficacious in expelling any that may remain in the stomach or intestines, that I constantly prescribe it in cases of dyspepsia, when flatulence is a prominent symptom. Patients like it, and often continue taking it for months or years. It acts as an antiseptic, probably in much the same way as glycerine, oil of cajeput, and oil of eucalyptus. It is now very largely used in the treatment of this common complaint.

The publication of my paper on Pure Terebene brought me letters from medical men in all parts of the country, many of them giving detailed accounts of patients under their care who had suffered from Winter Cough and had been treated with this drug. I tabulated the results so obtained, and

found that, of the ninety-four additional cases, a distinct success was recorded in eighty-one. In six of the cases of failure a further investigation showed that there had been an incomplete diagnosis, the patient suffering from some complication, such as aneurism or aortic disease, the existence of which had not previously been suspected. In ten cases the patients complained of nausea after taking the medicine; and in several instances, when inhaled from lint, it excited the cough and apparently acted as an irritant. The explanation in all probability is, that at that time much of the Pure Terebene sold was of inferior quality, and might, with a closer approach to accuracy, have been described as "impure" terebene. Medicines, as a rule, do not improve with keeping, but Pure Terebene is certainly an exception, for as it gets old it becomes bland and oily. When the old stock, much of which had been in the chemists' shops for years, was exhausted in consequence of the sudden demand, a new and crude Pure Terebene was substituted, many specimens being extremely irritating and quite unfit for internal administration.

A few months later an inquiry into the value of Pure Terebene as a therapeutic agent was undertaken by the Collective Investigation Committee of the British Medical Association, and much valuable information on the subject was obtained. The results were, in the main, confirmatory of the statements already made.

Surgeon-Major Wallick has pointed out that the flavour of Pure Terebene is very similar to that of the fruit of the Mango, and suggests that a principle might be extracted from it which would be of use in the treatment of bronchitis. I obtained a small supply of the fresh fruit from India, and gave it to some of my bronchitic patients, who were pleased with it. I was unable to make any very accurate observations, as there was not enough for the purpose. I sometimes prescribe Mango Chutney, which is readily procurable in London; but I am hardly prepared to say that it possesses any very decided therapeutic action. Dr. Wallick's suggestion is a good one, and it is well worth the attention of sufferers in India and South America, where an abundant supply can be obtained. There was at

one time an idea of making a "Mango-Terebene," but it has not yet been worked out practically.

To prevent any misconception, I may state that there is now not the slightest difficulty in obtaining Pure Terebene, in unlimited quantities and of exceptionable purity. There seemed to be an idea that I obtained my drug from some special source, but such was not the case. My observations were made chiefly at the hospital, and the supply was obtained by the Dispenser in the usual way, and without any instructions from me. When I prescribed it in private practice I simply took care to see for myself that the drug supplied was of good quality. There are no "proprietary rights" in the manufacture of Pure Terebene, and anyone can make it without let or hindrance. The point to remember, in testing it, is that it should be optically inactive, deflecting the ray neither to the right nor to the left. The consumption of Pure Terebene, as a therapeutic agent, is considerable, and many patients take it month after month in large doses. It is used quite as largely for flatulence as for Winter Cough. It is often sold, as I have said, in the form of lozenges,

tablets, and capsules, but I prefer the pure drug. Sometimes I hear that it has disagreed with a patient, or has perhaps brought out a rash; but, on investigation, it usually turns out that the drug employed was not the Pure Terebene at all, but an impure product suitable only for disinfecting purposes.

I have already quoted a typical case of chronic bronchitis treated with Pure Terebene, and, although there are some dozens of similar cases in my note-books, it would, I think, serve no useful purpose to reproduce them. I should like, however, to refer to a case in which large doses of the drug were taken with benefit:

CASE II.—"F. Z., aged 33, came to the hospital, on the 25th of November, complaining of a very bad cough. He had had it, he said, for many years, but was, as a rule, free from it in the summer. There was not much expectoration, and what there was came up without difficulty. The breathing was short, especially on exertion, and he had some difficulty in lying down at night. He was a native of London, and attributed his sufferings to the fogs.

On examining the chest there was found to be marked emphysema, with some rhonchus at the bases of both lungs. He was ordered ten drops of Pure Terebene on a piece of sugar every four hours. On the 1st of December he saw that the cough had been much better, especially in the day-time, and there had been a wonderful improvement in the breath, so that he could get about with comparatively little difficulty. The medicine was not nasty; in fact, it was 'rather palatable'. The dose was increased to fifteen drops every four hours, and on the 8th to twenty-five drops. On the 15th he reported that he was nearly well; the cough had almost gone, and the breathing was better than it had been for years. He was decidedly of opinion that twenty-five drops did more good than ten, and at his request the dose was increased to half-a-teaspoonful. On the 22nd he came in looking bright and well, and declared that he had never had any medicine which had done him so much good. It was 'rather warm going down,' but he liked it and felt better for it. It 'played on the water,' and he passed a great deal. The dose was

increased to a teaspoonful every four hours, and this was taken without difficulty. It excited no nausea, and did not act on the bowels. The administration of the medicine internally was now stopped, but he was given an ounce to use as a spray with Maw's Fountain Odorator. He continued this treatment till the 3rd of January, when he was so well that he was discharged."

The tolerance of the drug shown by this patient was very remarkable. In one other case, a man suffering from tapeworm, I gave it in teaspoonful doses four times a day for a fortnight without producing disagreeable symptoms, and without relieving him of his unwelcome visitor. I thought, from its affinity to turpentine, that it might prove beneficial. It is possible that, had I given it in a single ounce dose on an empty stomach, I might have been more successful.

In some cases, as I have said, I give it with olive oil, mixed with oil of peppermint, to disguise the taste, but patients, as a rule, preferred the pure drug. I have already referred to the fact that many of the patients took the Pure Terebene in the

form of an emulsion, containing half-a-drachm to the ounce. The following are the brief notes of a case treated with this preparation:

CASE III.—"Thomas S., aged 27, is a bath attendant and professional swimmer in the summer, and a scene-shifter and prize-fighter in the winter. He has hardly ever been free from cough since he has been at the baths. He has been under treatment for over six months, and says he has derived very little benefit. On reference to the notes of his case, it is found that he has had mixtures of all kinds, the remedies chiefly prescribed being squills, carbonate of ammonia, chloride of ammonium, and senega. His chest has been painted or rubbed with liniments of all kinds, and he has had carbolic acid and creasote to inhale. He was ordered the emulsion of Pure Terebene in half-ounce doses every four hours, and in a fortnight he declared that he was better than he had been for many months. His cough had almost gone, and his breathing was decidedly better."

Another way of making an emulsion of Pure

Terebene is to mix it with an equal quantity of cotton-seed oil. You take 160 minims each of Pure Terebene and cotton-seed oil, mix it with six drachms of powdered acacia and two drachms of powdered sugar, and then add enough water to make four ounces. The dose is from one to two teaspoonfuls, equivalent to from ten to twenty drops. There are no special advantages in this form, and, as a matter of fact, no difficulty is ever experienced in getting a good emulsion of Pure Terebene.

I have treated several cases of phthisis with Pure Terebene with benefit. Here is an example:

CASE IV.—"Wm. C. Y., aged 33, a tailor, had had a cough more or less for five years. It was worse in the winter, but rarely left him even in the summer. He expectorated a great deal of thick, yellow phlegm, chiefly in the morning. Four years ago he brought up nearly a pint of blood, and last year nearly a quart came up. He has lost flesh, but not very much. On examining the chest, there was found to be deficient movement under both clavicles. On the right side there was a little

crepitation at the apex, whilst on the left there

Fig. 3.—Atomiser for Pure Terebene, Pinol, Oil of Sandalwood, &c.

was cavernous respiration. He was ordered

drops of Pure Terebene on sugar every four hours, with an ounce to be used every week in the form of a spray. At the expiration of a fortnight the cough was easier, and the crepitation at the right apex could no longer be detected. The treatment was continued for two months, and at the expiration of that time he had gained ten pounds in weight and had lost all his symptoms. The physical signs of the cavity were still there, but there were no moist sounds, and the disease was practically arrested."

In a case of dust phthisis occurring in a bricklayer the same mode of treatment produced equally good results, the symptoms subsiding very quickly.

I have sometimes employed in the form of a very fine spray, in the treatment both of phthisis and chronic bronchitis, a mixture of equal parts of Pure Terebene, oil of cubebs, and oil of sandalwood, diluted with what is known as "liquid vaseline". This is used by means of an atomising apparatus, which consists essentially of a large glass jar, in which the medicated fluid is very finely divided and diffused by a blast of air, propelled by a

rubber ball or other means. A nose-piece is attached, and the spray may be inhaled through the mouth or nostrils. This formula gives excellent results, not only in Winter Cough but in post-nasal catarrh. I made some observations on this point in conjunction with a well-known singer and composer, and was astonished to find what a marvellous difference there was in the tone of his singing voice after using it for only a few minutes. He even thought that it improved the character of his compositions, but on this point I refrain from offering an opinion. The combination is a powerful expectorant, and if inhaled the first thing in the morning, when the mucous membranes are covered with viscid secretion, it will give very great relief.

When experimenting with Pure Terebene, I made some observations with an allied substance called terpene-hydrate. It is a derivate of turpentine, and is met with in small prismatic crystals. It is but slightly soluble in water, so I had it made into compressed tabloids, each containing two and a half grains, four being given every four hours. It succeeded admirably in some cases, but, as a rule,

it did not answer so well as the Pure Terebene, and little by little I abandoned its use.

During the last six or eight months I have used Pinol in the treatment of Winter Cough and Bronchitis with much success. It is made from the Pumilio Pine, growing in Alpine regions, above the snow level. In therapeutical action it is closely allied to Pure Terebene, but it is more fragrant. I give it on sugar in ten-drop doses every four hours, and have been much pleased with the results. It is an antiseptic, and is useful in the treatment not only of chronic coughs but of flatulence. As a spray it is wonderfully efficacious, often affording prompt relief. In a few cases I have employed for inhalations a mixture of Pinol and Pure Terebene, usually two parts of the latter to one of the former. Sometimes patients readily take Pinol when they dislike the taste of Pure Terebene. The treatment of Bronchitis by inhalation of Pinol is carried out systematically in many places on the Continent, especially at Baden-Baden, Isch, and Reichenhall.

At the Westminster Hospital we made a number

of observations on the treatment of Winter Cough with a spray of Pure Terebene and Pinol. As a rule we used a mixture of three parts of Pure Terebene and one of Pinol, the hand-ball spray apparatus being employed. The patients were all out-patients and came to the hospital every morning for treatment. Many of them had been under observation for some time previously. The results were extremely good, most of the patients obtaining immediate relief.

In the following obstinate case (reported by my clinical clerk, Mr. Lucas Hughes) benefit was experienced from the use of a mixture of Pure Terebene and Pinol in the form of a spray:

CASE V.—"J. S., aged 62, is by occupation a tailor, and is much exposed to draughts. He has had a cough seven winters, and a little sometimes in the summer as well. Usually it lasts from November until well on in March. It is distinctly paroxysmal in character, there being on an average twelve attacks in the twenty-four hours, each lasting two or three minutes. The patient is kept awake coughing night after night and gets very little rest.

The expectoration is abundant, thick and yellow during the day and streaked with black towards

Fig. 4.—Improved Atomiser, made by Codman and Shurtleff of Boston, Ma.

the evening. There are sometimes streaks of blood

after a severe attack of coughing. He is short of breath on exertion, and finds walking very difficult. He has lost flesh considerably and is quite a stone lighter than he was at the beginning of the winter. His appetite is bad ; and he sometimes vomits after an unusually severe bout of coughing. He has a well-marked arcus senilis and is not ruptured. The chest is markedly emphysematous, and there is a little rhonchus at both bases. The specific gravity of the urine varies from 1015 to 1025 and is free from albumen ; the heart sounds are normal.

"The treatment was commenced on February 22nd, when he was ordered a drachm of syrup of tar (U. S. P.) with five minims of the 1 in 50 solution of hydrochlorate of apomorphine three times a day. He was given an ounce bottle of Pure Terebene and told to take ten drops on sugar frequently. The Ipecacuanha Spray was also used, and he had 30 cc. of equal parts of the wine and water from a Richardson spray apparatus. On the 23rd the spray was repeated, and on the 24th the quantity was increased to 40 cc. On the 25th he had 40 cc. of the Ipecacuanha wine and water in

the morning, and 30 cc. of the pure wine at his visit in the afternoon. He then reported that his cough was much better, being less violent and less frequent. The expectoration was less in quantity, and was not so thick. The most marked improvement, however, was in the breathing, and he slept better and could get upstairs with much less difficulty. On the 27th he had another inhalation of 30 cc. of the pure wine, and stated distinctly that the large dose did him more good. He progressed steadily under the same treatment until March 3rd, when he caught a fresh cold, and the weather being inclement he thought it best to stay indoors. On the 7th he came again, and the treatment, for purposes of comparison, was then changed, a spray of three parts of Pure Terebene and one of Pinol being substituted for the Ipecacuanha Spray. He was also given an ounce of this mixture, and told to take ten drops on sugar frequently. On the 8th the new spray was repeated, and during the inhalation he expectorated a mass of mucus about the size of a shilling, after which the breathing was much easier. On

the 9th the spray was repeated; and on the 10th he had the spray of Pinol and Pure Terebene in the morning and of Pure Terebene alone in the afternoon, the quantity used on each occasion being about half-an-ounce. His cough was now much better, and the expectoration was less, but the breathing still distressed him at times. On the 12th he was given an inhalation of a drachm of etherial tincture of lobelia mixed with an equal quantity of water. This was repeated on several occasions, and from this time the improvement was marked. He was given a tonic and discharged."

CHAPTER V.

CHEKEN AND CUBEBS.

MY next observations were made with the drug called Cheken.

Cheken, or Chekan, or Chequen—for it is known by all three names—is an evergreen shrub, closely resembling our common myrtle, and it grows abundantly in the central provinces of Chili. It is usually said to belong to the genus Eugenia, but by some it is referred to the closely-allied genus Myrtus. The natural order Myrtaceæ contains many medicinal plants, as, for example, the clove (*Caryophyllus aromaticus*), cajeput (*Melaleuca minor*), pimento (*Eugenia pimenta*), and the members of the Eucalyptus tribe. A good description of Cheken, by Mr. Holmes, will be found in the *Pharmaceutical Journal* for February, 1879.

From a manuscript placed at my disposal by Dr. Henry von Dessauer of Valparaiso, I learnt that he had used Cheken for some years in the

treatment of a number of widely different complaints. Thus, as an inhalation, he uses it in diphtheria, laryngitis, bronchitis, and bronchorrhœa; as an injection, in certain affections of the mucous membranes, as gonorrhœa, leucorrhœa, cystitis, &c.; whilst given internally, in the form of syrup or liquid extract, it is said to aid digestion, allay cough, facilitate expectoration, and stimulate the kidneys to action. It is also an astringent, and is found to be of especial service in threatened hæmoptysis. Dr. von Dessauer used it with marked success in more than a hundred cases of bronchitis and phthisis. For many years he was physician to a large convent-school, many of the inmates of which suffered from consumption; hæmoptysis being of constant occurrence. During the two and a half years that he gave Cheken in this establishment, he had not a single death from phthisis, there were no fresh cases of hæmoptysis, and many of the patients who had had repeated attacks of bleeding from the lungs recovered and gained flesh and strength in a very marked manner. Equally good results were ob-

tained by other physicians in Valparaiso and elsewhere.

The liquid extract of Cheken is made according to the directions given in the United States Pharmacopœia for the preparation of fluid extracts, and corresponds in strength to the fluid extract of cinchona, &c.

In the *Practitioner* of May, 1880, I published a paper on "Cheken in Winter Cough". My first series included notes of fifteen cases of chronic bronchitis in which I employed Cheken, all the patients, with one exception, being men. The age of the woman was 51; the ages of the men ranged from 36 to 58. They were all bad cases, most of them of many years' duration. Many of them had been attending at the hospital for some considerable time, and almost without exception they had in former years undergone much medical treatment with comparatively little benefit. Their occupations exposed them to cold, and wet, and draught, and in some instances they had the additional disadvantage of working in a dusty atmosphere. They complained chiefly of par-

oxysmal cough, with thick yellow expectoration, and much shortness of breath on exertion. On physical examination of the chest emphysema was detected, with or without a little rhonchus at the bases behind. They were, in fact, ordinary cases of Winter Cough. The liquid extract of Cheken was ordered in two-drachm doses in a little water every four hours, the dose being usually increased at the expiration of a week to half-an-ounce. The medicine was always taken without difficulty. In all cases the patients obtained some benefit, and in most instances the relief was very marked. There was, in a few days, a decided improvement in the cough; expectoration was from the first easier, and soon diminished in quantity, and finally the dyspnœa was less.

The following may be taken as an average case:

CASE I.—"Mark R., aged 40, has suffered from cough, 'off and on,' almost all his life. It is not so bad in the summer, but in winter he 'almost goes in fits with it'. This winter he has 'had it bad' for about three weeks, and is unable to follow his occupation as a packer. There is a great deal

of expectoration, which is 'thick and sticky'. Sometimes it is streaked with blood, but only after violent coughing. He is very short of breath when he moves about, but not when he is quiet and is not coughing. The cough is worse than the shortness of breath, for the attacks of cough come on almost every time he moves, and last from five to ten minutes, straining him very much. He has lost his appetite, but does not think he has lost flesh. On physical examination of the chest there was marked emphysema, and a little rhonchus was found at the bases posteriorly. He was ordered two drachms of the cheken every four hours in half-an-ounce of water. In a week he returned, and said he was a great deal better in every way. The cough was easier, was 'almost well yesterday'. The phlegm 'comes up more readily,' but he did not think there was less of it. The shortness of breath was less, but that had not improved as much as the cough. On the whole, it had done him 'a great deal of good'. He was told to continue the medicine for another week, and his report then was that there had not been any

further improvement, though he had not gone back at all. His cough troubled him at night, and sometimes gave him no rest. The phlegm was somewhat less, and the breathing was a trifle easier. The medicine was then given every four hours, and on this the improvement was very marked. He did not cough 'a quarter so much,' and it no longer disturbed him at night. The phlegm, too, was 'considerably less,' though the shortness of breath was not much easier. He was sure the medicine did him more good when he took it every four hours, and was confident that it had benefited him greatly. He asked for a fortnight's medicine, and did not return."

Even in cases of phthisis some benefit was experienced. For example:

CASE II.—"A clerk, aged 40, with a cavity on the right side and consolidation at the left apex, was ordered two drachms of the liquid extract every four hours. In three or four days he noticed an improvement in the cough; the expectoration was less tenacious, and came up more readily; his breathing was easier; the night-sweating, from

which he had suffered slightly for a fortnight, ceased, and he slept better. At the expiration of a fortnight he said he was better in every way. He continued taking the medicine for three months, and then, the more distressing symptoms having been relieved, ceased to attend."

In three other cases of phthisis the Cheken eased the cough and lessened expectoration; the patients expressing themselves as feeling better. In two cases no benefit was experienced.

That Cheken can be given in large doses, without the production of any disagreeable symptoms, is shown by the following case:

CASE III.—"A clerk, aged 36, came to the hospital complaining of a distressing paroxysmal cough, from which he had suffered for about two months. There was very little expectoration, but what little there was was thick and yellow, and came up without difficulty. There was no loss of flesh or night-sweating. The chest was somewhat emphysematous, but no rhonchus could be detected. He was ordered two drachms of the extract of Cheken four times a day, and a week

later he reported that the cough was much better, and the expectoration nearly gone. He continued taking the medicine for a fortnight longer, and then seems to have caught a fresh cold, for the cough, which had almost ceased, returned with increased violence, accompanied by a great deal of expectoration. He was then ordered an ounce of the extract of cheken in water three times a day, and this he took for a fortnight, not only without difficulty, but with marked benefit to the cough. He was then given, experimentally, an ounce and a half of the liquid extract in a little water three times a day, and this he took for a week without the slightest inconvenience, and without any unpleasant effect, except that it confined his bowels."

Soon after the publication of my paper, war broke out between Chili and Peru, and for a long time the supply of the drug was extremely limited. From time to time, however, I obtained small supplies, just sufficient for my own patients, and the results were extremely satisfactory. In 1882, Dr. William A. Johnson of Raleigh, Indiana, published

a paper in which he stated that he considered that Cheken deserved "a high rank among the therapeutic agents indicated in the catarrhal condition of the respiratory mucous membrane"; whilst some months later Dr. William Evans of Belle Plaine, Iona, recorded a case of Winter Cough in which "the first few doses acted like a charm, giving immunity from coughing for several hours at a time". In 1884, Dr. Hackleman of Rushville prescribed it for a patient who had suffered from a cough off and on almost all his life, especially in the winter months, with the result that the patient was speedily cured. He also used it with benefit in the sympathetic cough which occurs in adults who are brought in contact with children suffering from whooping-cough. In 1885, Tangeman of Ohio published an elaborate paper of the uses of Cheken in medicine, in which he gives in detail a number of cases treated by the new remedy, one of the most striking being the following:

"H. O., aged 60, suffered from an old chronic cough, which had lasted for years. It was scarcely noticeable during the summer; but as soon as the

damp weather set in the cough became quite annoying, causing loss of sleep and general debility. There was little or no expectoration. Muriate of ammonia, with ipecacuanha and opium, had been given a faithful trial, but the benefit was only temporary. It was now suggested that cheken should be given a trial. Its use was followed by the prompt relief of the cough, and more easy expectoration and freer breathing. The patient now sleeps well at night."

During the last three or four years I have used the liquid extract of Cheken in a large number of cases of bronchial catarrh, but I have not thought it worth while keeping notes of the results. It seems to me that it comes in admirably towards the end of a course of treatment, just to give the finishing touches to the cure. I rarely use it in the initial stages, but it comes in handy later on.

Concurrently with these observations I treated a number of cases with cubebs, a remedy which was brought to my notice by Dr. George Bird. The tincture was given in hot linseed-tea, flavoured

with lemon-peel, night and morning, the patient being instructed to sip it slowly. In a few cases the powder cubebs was given, but it usually made the patient sick, and many of them complained of its nauseous taste. The results obtained with the tincture of cubebs were excellent, and I should certainly recommend it in old-standing cases, especially when the expectoration is thick and yellow.

The following is a rough jotting of a case of Winter Cough greatly benefited by the administration of cubebs:

CASE IV.—"George R., aged 32, is a painter and grainer. Is much exposed to wet, and often has to stand for hours in houses before they are dry. Has had a Winter Cough three or four years: comes on just at the beginning of November, and lasts till the summer. Coughs the best part of the day: begins as soon as he gets up, and does not stop till he gets to bed again. Brings up a good deal of phlegm—a cupful or more at a time, often streaked with blood. Shortness of breath is often very great at times, especially after an

attack of coughing. Has lost a little flesh, but nothing much. Physical signs: 'Expiration much prolonged both sides, and sonorous rhonchus, both with inspiration and expiration, all over front and back'. Ordered tincture of cubebs, two ounces. A teaspoonful, in a cup of hot linseed-tea, to be sipped slowly night and morning. A week later much better, cough easier, rhonchus less, expectoration brought up more freely, and breathing less difficult. Continued for another week, when reports that he is nearly well. A third week completes the cure."

The next case is one of Winter Cough complicated with albuminuria, and treated with Tincture of Cubebs:

CASE V.—"William B., aged 58, a labourer, works on the barges for a contractor, unloading ashes, breeze, stones, and gravel. Has been at it for fifty years, and has been out in all weathers since he was a boy eight years old. Has never known what it was to have a home, and has slept mostly where he could. Drinks a tidy amount, but not more than most of his mates. Has

patronised most of the hospitals at one time or another, and thinks they are useful institutions. Has had a cough for a good many years, but as a rule has not taken much notice of it. Cannot say how many years he has had a cough, for he has no wife and no family, and nothing in particular to go by. Thinks it came on when first he worked on the canal, but cannot say when that was. Spits a good lot, but, being on the barge, does not pay much attention to it. Does not think he ever spat blood; might have done, but, if so, never heeded it. Is short of breath, worse luck, and would like to be as 'fly in the wind' as he was when a youngster. Would be grateful for anything that would do him good. Examined, is found to have sibilant rhonchus all over chest in front, with moist sounds posteriorly. Urine contains nearly two-thirds of albumen, not examined for casts. Given a teaspoonful of tincture of cubebs four times a day. No means of getting linseed-tea, so told to take it neat or in beer. A week later reports no difficulty in taking it, eased cough wonderfully, took the tightness out of his chest,

and made breathing easier. Acted on water wonderfully. Urine now contains only one-sixth albumen. Medicine continued, and a week later patient reports that he is better than he has been in winter for a long time, cough almost gone, expectoration less, and breathing nearly well. Urine, albumen only a trace. After another week's treatment, there is only a trace detected with difficulty. Cough almost gone. Given a tonic, and discharged greatly benefited."

A case of old phthisis and winter cough treated first with powdered cubebs and then with the tincture:

CASE VI.—"Mary M'C., aged 46, had a cough from the time she was 17 to about 24. It then left her for about five years, but after the birth of her first child it returned, and she has had it more or less, winter and summer, for the last eighteen years. Sometimes it goes away in the summer, but not infrequently it lasts all the year round. This year she has had it since July right up to the present month of December. It comes on in fits, and is especially bad if she is washing,

the steam soon setting her off. There is a great deal of expectoration, thick and yellow, but fairly easy to get up. She has spat blood, but not much of late years. She is short of breath, especially when she goes out in the fog or into a cold room. Sometimes she gets shortness of breath in the evening without very much cough. This shortness of breath is just as bad in the summer as in the winter. On examining the chest, it is found that there is a great deal of high-pitched rhonchus. The breathing can be heard without the aid of the stethescope, and at some distance from the chest. The patient was ordered a drachm of powder cubebs in water three times a day. She reported that she had much difficulty in getting it down, and that it made her very sick. Still she persevered with it, and it certainly brought up the phlegm, and eased the breathing wonderfully. At the end of a week she was given the tincture of cubebs—a teaspoonful—in a cup of hot linseed-tea three times a day. This answered almost as well, and was much less disagreeable to take. At the expiration of a fortnight of this

treatment, the cough had almost gone, and, to use her own expression, she was 'quite a different woman'. She was given a teaspoonful of the syrup of the hypophosphites twice a day, and a month later returned to say that she was stronger and that there had been no return of the symptoms."

When the asthmatic symptoms predominate, I often use Cubebs in the form of cigarettes, telling the patient to inhale the smoke well into the lungs. Sometimes I have the cigarettes made in a small machine, or rolled by hand; and sometimes I prescribe Marshall's Cubeb Cigarettes, which are largely sold in America under the name of "Smoke Cubebs". The odour of burning cubebs is, perhaps, not very agreeable, but that is a matter of small consequence to an asthmatic, or sufferer from emphysema. For hospital patients, I usually prescribe a couple of ounces of dry finely-powdered cubebs, and instruct them to smoke it in a pipe.

CHAPTER VI.

CHLORIDE OF AMMONIUM INHALATIONS.

THE value of Chloride of Ammonium in the treatment of many affections of the respiratory organs is very generally recognised. From time immemorial it has been given in the form of a mixture often in combination with carbonate of ammonium, senega, and other drugs. Its pungent saline taste can be disguised by the addition of a little liquid extract of liquorice—say half-a-drachm to the ounce. Compressed tabloids of Chloride of Ammonium are useful in many catarrhal conditions of the fauces and pharynx, and are largely employed by singers and public speakers. When the action of the drug on the larynx, trachea, or bronchial tubes is required, a different mode of administration must be resorted to, and the drug is then inhaled in the form of fumes or smoke, developed by the combination of the vapour of hydrochloric acid and ammonia. Many forms of

apparatus have been devised for generating nascent chloride of ammonium, and I agree with Dr. Kendal Franks of Dublin, who recently published in the *Lancet* an interesting article on the subject, that by far the best is the Vereker Chloride of Ammonium Inhaler. I have had one in constant use for the last three years, and find that it answers admirably. It consists essentially of three bottles with connecting tubes. In the first is placed hydrochloric acid, in the second a mixture of ammonia and water, whilst the third, which communicates with the other two by a three-way tube, acts as a wash-bottle and separates any trace of free acid or ammonia from the vapour. The whole apparatus is perfectly simple, and a quarter of an hour devoted to getting it into working order and regulating it will amply suffice for a supply of inhalations for many weeks. The only difficulty I have experienced has been in getting the vertical tubes which regulate the amount of air passing through the acid and ammonia to slide up and down in the india-rubber corks, but this is easily overcome. All you have

to do is to push out the tubes, clean them carefully, and apply a drop of oil, when they work with the greatest ease. I generally detach the india-rubber tubing leading to the mouthpiece, and substitute for it a piece three or four yards long. The advantage of this is that the patient

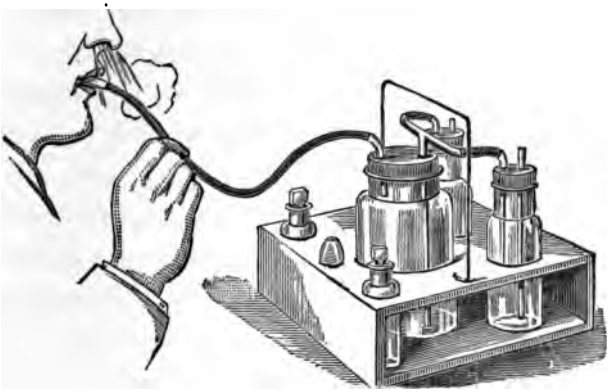

Fig. 5.—Vereker Chloride of Ammonium Inhaler.

is not obliged to bend over the apparatus, but can sit back in his chair, or stand up and take a good deep inspiration, completely filling the chest. Some patients do not know how to breathe, but take little puffs which are no good; but a few minutes' instruction and a practical illustration or

two usually sets this right. One man I remember, and only one, who could not be made to breathe properly. After several futile attempts to teach him, I got out of patience and packed him off to a singing master to have lessons in the art of breathing. It was a lucky thing for him that I did so, for his professor discovered that he had a tenor voice of exceptional tone and quality. He took lessons, and after a couple of years' instruction and hard work developed into a "professional," and is making a large income. He now "blows a cloud" with the apparatus with the greatest ease. Patients sometimes complain that the fumes are acid, and that they cause choking. As a matter of fact, a little excess of acid rarely does any harm, whilst an excess of ammonia is very irritating. The method for avoiding an excess of ammonia is simple. Put into the wash-bottle a little tincture of litmus and a few drops of acetic acid. As long as the water is coloured red there is no fear of any uncombined ammonia coming over, as it is seized by the acetic acid. When the water turns blue a

little more acetic acid must be added. In cases of catarrhal deafness, the fumes are readily forced up the Eustachian tube by filling the chest and mouth, pinching the nose, and then swallowing. It is astonishing what good this method of treatment often does. Sometimes I use the chloride of ammonium fumes alone, but far more commonly I employ them as a vehicle for the administration of other remedies. For example, I want to give Pure Terebene in a case of Winter Cough. All I do is to put a few drops on a piece of absorbent cotton wool and introduce the little pellet into the water of the wash-bottle. The fumes which come over are impregnated with the Pure Terebene, and are carried to the innermost recesses of the bronchial tubes. In the same way I give inhalations of oil of cubebs, oil of sandalwood, and various other volatile drugs which exert a beneficial action on respiratory apparatus. I have cured, in this way, obstinate cases of bronchial catarrh, chronic bronchitis, post-nasal catarrh, and deafness resulting from obstruction of the Eustachian tube.

The "Vaporoles," prepared by Messrs. Burroughs, Wellcome, & Co., may be used in connection with the Vereker Inhaler. They consist of little glass capsules containing the drug, surrounded by absorbent cotton wool, and encased in silk. The capsule is crushed and dropped in the water in the wash-bottle. The Vaporoles are numbered according to the following list:

1	Vaporole of Carbolic Acid.,	. . .	20 minims.
2	,,	Nitrite of Amyl, . . .	5 ,,
3	,,	Ether, ...	30 ,,
4	,,	Compound Tincture of Balsam,	30 ,,
5	,,	Chloroform, ...	30 ,,
6	,,	Creasote, ...	10 ,,
7	,,	Oil of Lemon and Cubebs, .	5 ,,
8	,,	Tincture of Iodine, . . .	10 ,,
9	,,	Oil of Juniper, . . .	2½ ,,
10	,,	Pure Terebene, . . .	10 ,,
11	,,	Pinol, ...	10 ,,
12	,,	Oil of Eucalyptus, . . .	10 ,,

Dr. Kendal Franks, to whose paper I have already referred, says: "I have found the best results to follow the inhalation of chloride of ammonium in chronic catarrhal conditions. In acute catarrh it does little good—at least, when the disease is once fully established; but in the

beginning of an acute catarrh I believe it will be found often to check its further progress. I have known it to be so in my own case, and have been greatly gratified to find the symptoms of a cold in the head disappear after an hour's intermittent use of the inhaler. In chronic catarrh of the post-nasal region, so frequently associated with deafness, due either to chronic otites media or to obstruction of the Eustachian tubes—conditions sometimes very intractable to ordinary means—I have found the regular use of the inhaler for weeks, or even months, give the most satisfactory results. The best method of using it in nasal catarrh, or in chronic inflammation of the mucous membrane lining the nasal or post-nasal regions, is to inhale freely by the mouth and exhale by the nose. In this way the chloride of ammonium comes directly in contact with the affected parts. In catarrhal conditions of the middle ear or of the Eustachian tube, the salt can be brought directly to bear upon these parts by having recourse to Valsalva's method of inflating the ear. A deep inhalation is made by the mouth; then

exhalation through the nose is begun, and as soon as the white cloud is observed to emerge from the nostrils, they are closed by suddenly compressing them between the thumb and forefinger. The mouth is firmly closed, and the patient makes an effort, as it were, to force the air through the nostrils. The apertures being closed, the distending power of the exhaled air forces open the Eustachian tubes, and the vapour enters through them into the tympana. This may be done two or three times at a sitting without any evil effect. I have met with many cases where this plan of treatment has alone sufficed to effect a cure where other methods had failed. When the Eustachian tubes are obstructed, so that air cannot be forced through them by Valsalva's method, the occasional use of Politzer's bag during the earlier part of the treatment will usually suffice. In chronic laryngitis, especially of the catarrhal form, chloride of ammonium inhaled is of great value. In the early stages of that form of laryngitis which so often accompanies phthisis, when there is erosion of the mucous membrane covering the inter-

arytenoid fold, or when there is chronic inflammation of the vocal cords themselves, I have seen good results follow from this vapour; more especially when combined with some volatile oil, such as oil of eucalyptus or pine oil, in a manner I shall immediately describe. Again, much benefit may be derived from its use in affections of the trachea and bronchial tubes. Some years ago I prescribed it for an elderly gentleman who was confined to his room in the beginning of winter for a chronic cough. He had been liable to chronic bronchitis every winter, which kept him indoors for several months. Most of the usual remedies had failed with him, so, at last, I determined to try the effect of chloride of ammonium as an inhalation. He was directed to use it three times a day, for fifteen minutes at a time. In a fortnight he was sufficiently well to go out, and the use of the inhalation during the winter prevented the return of his bronchial trouble."

For the last three years I have employed this chloride of ammonium inhaler in a large number of cases, and the results, I am glad to say, have been

almost uniformly successful. I have used it both at the hospital and in private practice with equal benefit. At the hospital the patients come every day for ten days or a fortnight, and the inhalation is superintended by one of the clinical assistants. It is not a good plan to give the patient the apparatus straight off. He must be carefully instructed in its use, or too often he makes some mistake and does himself more harm than good.

The following are rough jottings from some of the cases in my note-book:

CASE I.—"G. H., member of Parliament, has had a bad cold for three days, constant sneezing, and running from eyes. Dull, heavy, and depressed, can't read and can't think. Little cough, but not much. Pain across forehead, and disinclination for exertion. Has had a Turkish bath, and took two pills last night. Has been using some strong smelling salts his chemist gave him. Is anxious to get well, as he has to speak in the House one day this week. Given the chloride of ammonium inhaler with a mixture of pure terebene, oil of cubebs, and oil of sandalwood in the wash-bottle. Much

pleased with it, and insists on using it for nearly half-an-hour. Says the smell of the sandalwood is strangely familiar to him—can't account for it. Comes next day and again inhales for half-an-hour. Writes at the end of week to say he is all right, and that he made a brilliant speech."

CASE II.—"M. B., a general, retired. Is deaf, has been deaf for years. Was in the artillery; says all gunners deaf, so that they never hear anything not good of themselves. Has strange noises in his ears. Dislikes any noise in a room, especially rattle of knives and forks at dinner. Prefers dining alone on this account. General condition very bad, partly from want of exercise. Has consulted all the specialists, and has had his ears examined with many strange instruments. Says that the advantage of consulting many doctors is that no two of them agree, and you are not alarmed by what they tell you. Not much in favour of inhalers. Tried one once, but it blew up. Is introduced to the Vereker Inhaler and takes to it kindly. Chloride of ammonium used first alone and then with pinol. Purchases one for himself, and at end of

month writes to say it has done him much good."

CASE III.—"Mr. M'C., a well-known architectural sculptor, has had cough in winter for many years. Travels about a good deal, and is often in damp, dusty places. Is very short of breath, especially on exertion. Is ordered syrup of tar and takes several pints of it. Also has the chloride of ammonium inhaler, which he used pretty constantly, for two years, sometimes alone and sometimes with pinol, pure terebene, cubebs, or sandalwood. Takes pure terebene or pinol when he is travelling. Derives much benefit from the treatment, but never really gets rid of the cough."

CASE IV.—"Mr. C. C., formerly a Common Councilman, but has retired from business, has mitral regurgitation, irregular action of heart. Much benefited by small doses of digitalis or strophanthus. Very subject to bronchitis, and has to take the greatest care of himself. Has tried many remedies, but likes none so well as the chloride of ammonium inhaler. Three or four visits generally set him right again. Always flies to it on the outset of an attack.

Says it is his sheet anchor. Has consulted me at intervals for eight years."

CASE V.—"Captain W., commander of an Australian liner, has been at sea all his life and is very subject to a cough. Has had plenty of medical advice from his surgeons. Has a collection of prescriptions of his own. Tries them on other people first, and if they do well takes them himself. Is always taking medicine. Chloride of ammonium inhaler eases cough and brings up phlegm. Will take one on his next voyage with a supply of pinol, pure terebene, and cubebs. Will try it on the passengers. He is not heard of again."

CASE VI.—"Miss A. W., singer, contralto, often loses her voice, especially when she has an engagement. Chest and vocal cords healthy. Thinks symptoms partly due to nervousness. Voice uncertain, and apt to give in the wrong place. Something wrong with an upper C. Uses the chloride of ammonium inhaler, and takes phytolacca assiduously for a couple of days before singing. Maintains that it does her good. Impossible to contradict a lady, so treatment continued."

A word about the duration of the inhalation. At first I was accustomed to order it to be used for about ten minutes three times a day, but further experience demonstrated that much better results could be obtained by inhaling for half-an-hour or more three times a day. This is a point to which sufficient attention is not paid. To get the best possible results from the Vereker chloride of ammonium inhaler a certain amount of experience in its use is necessary.

The following case recently treated at the Westminster Hospital shows the benefit to be derived from the chloride of ammonium inhaler, combined with cubebs when the inhalations are given daily for half-an-hour or more:

CASE VII.—"Thomas S., aged 42, cook in the House of Commons, has had a winter cough for the last five or six years, attributable, he says, partly to the heat of the kitchen, and partly to having to cater for members of such various shades of political opinion. The strain on his mind is very great, and he fears that unless he improves he will have to give up the profession. He drinks beer, the wines

at the House not being quite up to his mark. His cough troubles him and keeps him awake at night, and there is a good deal of expectoration. His chest is emphysematous, and there is a good deal of rhonchus at both bases. On March 28th he was given an inhalation for half-an-hour with the Vereker's chloride of ammonia inhaler, and this was repeated on the 29th, 30th, and 31st, with benefit both to the cough and shortness of breath. On the 3rd of April the inhalation was repeated, with the addition of a few drops of oil of cubebs, on absorbent cotton wool in the wash-bottle. This was continued daily for half-an-hour until the 11th, when all the prominent symptoms had subsided, and he was discharged practically well."

CASE VIII.—"Jane S., æt. 37, has had a cough chiefly in the winter for eight years. It is always worse when she is pregnant, a condition which occurs frequently. The cough is hard, she says, and it reminds her of a dog barking more than anything else. The attacks come on in paroxysms and last ten minutes or more, accompanied by copious expectoration. She is a charwoman by

birth, but does a little laundry work as well, and that knocks her up more quickly than anything. The cough makes her short of breath, and she has great difficulty in getting upstairs. She was treated with the chloride of ammonium inhaler, a few drops of cubebs being placed on the cotton wool in the wash-bottle. The inhalation was given for half-an-hour daily, and in six days, aided by a little improvement in the weather, she was so much better that at her request she was discharged. She was given enough aromatic syrup of tar to last a fortnight, and was not seen again."

Case of Chronic Bronchitis in a beer-drinker treated with chloride of ammonium inhalations:

CASE IX.—"Eliza W., æt. 32, a bookbinder, has had winter cough for twelve years. The cough is hard and dry at first, and then after a time gets looser, and there is a good deal of expectoration. It is a violent cough, and is usually worse the first thing in the morning. The patient is a large beer-drinker; she does not care for spirits, but at night when the work is over she and some other girls get together and drink as long as the money lasts. On

examination she is found to be emphysematous, and there is a good deal of rhonchus over both sides of the chest. She is very nervous and shaky, and has to be given some quinine and iron before the treatment for the bronchitis can be proceeded with. On the ninth, tenth, eleventh, twelfth, thirteenth, and fourteenth she has an inhalation for half-an-hour each time. The cough improves, the expectoration diminishes, and she is discharged with a recommendation to abandon the beer-drinking orgies in favour of a lighter and more frivolous form of amusement."

Case of Bronchitis in a child (reported by Mr. E. Lucas Hughes) treated by inhalations of chloride of ammonium and cubebs:

CASE X.—"Alice W., æt. 10, is stated on the authority of her mother to have had a very bad attack of bronchitis when fifteen months old. She has suffered more or less ever since from bronchitis usually in a chronic form, with from time to time acute exacerbations. It is bad all the year round, but worse in the winter. It commences quite at the beginning of the winter, lasts through the

winter and early spring, without much improvement till May. The child is fairly well for only three or four months in the year. The attacks of cough are always violent and prolonged. The mother says it is a hard cough which shakes the room. Sometimes it ends in vomiting. There is a great deal of phlegm, but usually it comes up quite easily. It is sometimes yellow and sometimes white, and sometimes it is streaked with blood. The child is short of breath and cannot join in games as other children do. She does not lose flesh, and her appetite is fairly good, but she is weak and delicate and sweats a great deal at night. The parents were always ill more or less: the father died of bronchitis, and the mother looks as if she would follow in his footsteps. On examining the child she is seen to be thin and ill-nourished. The chest is emphysematous, and there is sibilant rhonchus all over back and front, with bubbling rhonchus at the bases posteriorly. She had had cod-liver oil and a good deal of tonic medicine, but without materially benefiting the cough.

"On April 9th she had an inhalation of chloride of ammonium from the Vereker apparatus, a few drops of oil of cubebs being placed on the cotton wool in the wash-bottle. She soon learnt to inhale well, taking the fumes right down into the chest. It was repeated the next day, and on the 11th the time was increased to half-an-hour. During the inhalation she expectorated usually from two to four ounces of thick yellow phlegm. On the 13th and 14th the half-hour inhalation was continued, and then in consequence of bad weather the treatment was temporarily suspended, the child being unable to come in the rain. On the 19th the treatment was resumed and the inhalation was given for an hour, the result being the expectoration of five ounces of mucus. On the 20th the inhalation was given for three-quarters of an hour, and on the 21st and 23rd for an hour each time. The last inhalations were on the 25th and 26th, when the child had improved so much that her further attendance was not necessary. She had been under treatment seventeen days, and had had eleven inhalations. The final note was: 'The

patient has very greatly improved. For the last five days there has been no expectoration during the inhaling, and although the weather has been very unfavourable the cough has practically left her.'"

The following is a successful case in an adult:

CASE XI.—"Mary H., aged 21, is engaged in mantle-making, and works ten hours a day and sometimes more. She has half-an-hour's walk to and from business, and as her boots are bad and her cloak worn and thin, she often gets wet and catches cold. Her earnings are small and she does not get too much to eat. She has had a cough ever since she was fourteen, bad all the year round and worse in the winter. She has spat blood several times, a pint or more at a time, but never enough to prevent her going to business if they were busy. She has never been weighed, not being able to afford expensive luxuries. She is short of breath, but as she has no stairs to go up does not complain. She is extremely anæmic and looks weak and ill. She has some consolidation at the right apex, but there is no crepitation, probably

in consequence of her straitened circumstances. She was taken in charge by Mr. Hughes, who superintended the administration of the chloride of ammonium inhalation with cubebs for ten days. It eased the cough and shortness of breath, and she was grateful. She was given some iron and cod-liver oil which did her good. What she wanted most was a good meal, but that was not in the hospital pharmacopœia."

In many cases of congestion of the nasal mucous membrane and post-nasal catarrh the inhalation of chloride of ammonium is useful.

Case of congestion of the nasal mucous membrane treated with inhalations of chloride of ammonium (reported by Mr. E. Lucas Hughes):

CASE XII.—"Edith H., aged 13. It is stated by the parents that for the last three years she has not spoken clearly, and it seemed as if her nose were stopped up. She has never had any illness except measles when eighteen months old, and since then she has never closed her mouth properly. A year ago she became very deaf. She had a profuse discharge from the right ear, especially at night.

It lasted over a month and then ceased; since that her hearing has improved. Her tonsils were supposed to be enlarged, and she was treated with a gargle of chlorate of potassium (a saturated solution in water) for some weeks with benefit. She was sent to a special hospital for diseases of the throat, and underwent several operations, a portion of the mucous membrane being removed it is said, but there was no improvement. She snores at night and always sleeps with her mouth wide open. On examining the nose the mucous membrane was found to be greatly congested, and the apertures were almost completely closed posteriorly. She was given the chloride of ammonium inhaler for forty minutes daily. After six inhalations the nasal mucous membrane was found to be nearly normal in appearance, and she could breathe with much less difficulty. After the tenth inhalation she was still better and slept with her mouth shut. The inhalation was now given twice a day, half-an-hour in the morning and an hour in the afternoon. At the expiration of fifteen days the child was much improved. Two months later she

returned, and on examination it was found that the mucous membrane of the nose was again very much swollen. There was a return of the old symptoms: she slept with her mouth open, made a peculiar snoring noise in her sleep, and was deaf in both ears. The inhalations were resumed for an hour daily, pure terebene and pinol being added to the water in the wash-bottle. The improvement was marked, but the inhalations had to be continued for a month before it was felt safe to discharge her."

Case of obstruction of the nostrils due to swollen mucous membrane in a child:

CASE XIII.—"George C., æt. 14, has been deaf and has had much difficulty in breathing through his nose for the last seven years. He had measles when about five, followed by scarlet fever, after which he had his tonsils removed. He was a seven months' child and has always been delicate. He has been at a board school and has made much progress, but his lessons have always been a difficulty to him. In the winter he has a cough, and unless fed up and taken great care of gets so weak

that he can hardly get about. The mucous membrane of both nostrils is swollen and inflamed, and the right membranum tympani is ruptured. On April 12 treatment was commenced with the chloride of ammonium inhaler, the patient on four consecutive days inhaling for half-an-hour a day. The cough was relieved and there was less difficulty in breathing through the nostrils, the mucous membrane of which was less congested. From the 17th to the 21st the inhalation was given for an hour daily, and the improvement was much more marked. The cough ceased, the breathing was easier, and the patient slept well at night. The inhalations were then discontinued, and the patient was given iron and cod-liver oil. The improvement resulting from the inhalations was very noticeable."

The following case, treated by Mr. Lucas Hughes, illustrates the benefit which may be derived from prolonged inhalations of chloride of ammonium in children :

CASE XIV.—"Minnie C., æt. 8, has always been a delicate child. Had scarlet fever, followed by croup, bronchitis, and inflammation of the lungs.

Has had a cough almost ever since, worse in winter, but practically continuous all the year round. She sleeps with her mouth open and is deaf in both ears. She is very short of breath and is incapable of much exertion. She sometimes has acute febrile attacks lasting for several weeks, during which her eyelids swell and she sneezes a great deal. On examining the chest it was found that there was sibilant rhonchus all over both sides. She was given the Vereker chloride of ammonium inhaler, and told to inhale for half-an-hour. The treatment was commenced on April 21, and on the 24th it was increased to an hour a day. On the 26th there is a note that the cough has greatly improved and that she sleeps better at night. The treatment was continued until May 10, when the cough had ceased, and on examination of the chest it was found that the morbid sounds in the chest had disappeared. Her mother stated that she was better than she had been for some years. No difficulty was experienced in teaching the child to inhale, and she seemed thoroughly to enjoy the operation.

The following case was also treated at the hospital:

CASE XV.—"Kate S., aged 27, married, has had a cough more or less ever since she was three years of age, but it has been much worse the last nine years, especially in winter. She has five or six paroxysms every day, each lasting for three or four minutes. The expectoration is very copious, is thick and yellow, and comes up easily. She has noticed streaks of blood from time to time. She is short of breath and has some difficulty in getting about. She has no appetite and has been losing flesh for over a year. The chest was carefully examined, but nothing was detected beyond slight emphysema. Mr. Hughes gave her an inhalation from the Vereker Inhaler daily for an hour for eight days, and at the expiration of that time she had much improved, and the cough troubled her but little. She was given Kepler extract of malt and cod-liver oil for a fortnight, and was then discharged much better in every respect."

CHAPTER VII.

FUMING INHALATIONS.

FUMING Inhalations—inhalations, that is to say, of smoke of various kinds—are of service in the treatment of chronic bronchitis, especially when the asthmatic element predominates. The ordinary nitre papers are made by dissolving from half-a-drachm to a drachm of nitre in water and saturating blotting paper with the solution. When dried they burn readily, giving off dense white fumes. The smoke has been analysed and is found to contain carbonic acid, nitrogen, watery vapour, cyanogen, ammonia, and nitrate of potassium. Hyde Salter, in his classical work on Asthma, narrates many cases of spasmodic dyspnœa which have been benefited by this simple remedy. The ordinary nitre papers often fail to give relief because they are not strong enough. For some years past I have used very strong nitre papers containing both the nitrate and the chlorate of

potassium. Each paper is composed of six folds of blotting paper, six inches square, and they are made by dipping them in a hot saturated solution of chlorate of potash and nitre. They should be dried slowly in front of the fire, or, better still, in the open air. The papers so prepared, which may conveniently be called nitre tablets, are as thick as cardboard, and they are covered all over with crystals of the salts with which they are saturated. Sometimes I add iodide of potassium to the solution, and this, I think, increases their efficacy. Before they are quite dry they may be sprinkled with Friar's Balsam, Essence of Camphor, Tincture of Sumbal, or Tincture of Stramonium. In this way several varieties of nitre paper are available. Sometimes one form will succeed when others have failed. Their mode of use is simple. The door and windows having been closed, the tablet is folded in the middle so as to make it like a tent or the half-open cover of a book. It is placed on a tin plate or the fire shovel and lighted at each end, when it burns very rapidly, throwing out flames often four or five inches long, and giving rise to

dense volumes of smoke. They should not be lighted near the bed in case of accident. They are strong—strong enough to burn the house down unless care be taken. The sufferer often obtains speedy relief and drops off to sleep. They apparently exert some narcotic action, for they will often answer in cases of sleeplessness after the failure of opium, chloral, and other narcotics. Many of my patients, suffering from chronic bronchitis, speak highly of them; but they do not succeed in every case, and they must be used with caution. The "Ozone papers," so largely advertised, probably contain iodide of potassium in addition to the nitrate, and this is undoubtedly a useful adjunct. Care should be taken in the selection of the blotting paper employed, for much of it is made of coarse rags which, when burned, give off a most irritating vapour. I usually choose a white paper, and often place a small piece under the microscope to see if it is suitable for the purpose.

Some years ago, Mr. Martindale made me some "asthmatic pastilles," which contain, I think, equal parts of nitre, chlorate of potash, and lycopodium.

They are cast in moulds, and when dried burn readily, giving off white fumes.

There are several powders which, when burnt and the smoke inhaled, are used for the relief of asthma. Probably the best known of these is Humrod's Powder, but Bliss's Cure, the Green Mountain (Vermont) Cure, and Hockin's Remedy run it hard. From Humrod's Powder may be obtained an alkaloid which, when applied to the eye, dilates the pupil. I will not hazard a guess at the composition of these remedies, especially as some of them in all probability vary from time to time, but the following formula from the *Extra Pharmacopœia* may throw some light on the subject:

PULVIS LOBELIÆ COMPOSITUS.

Nitrate of Potassium, - - - 2 ounces.
Boiling Distilled Water, - - 2 ounces.

Dissolve and add to—

Lobelia in powder, - - - - - }
Stramonium leaves in powder, } of each 2 ounces.
Black Tea in powder, - - - - }

Mix well and dry.

I am not sure that fennel would not in sôme cases be a useful addition.

The following formulæ for fuming inhalations will be found useful:

(1) Powdered Nitre, an ounce; powdered Anise fruit, one ounce; and powdered Stramonium leaves, two ounces.

(2) Powdered Nitre, one ounce and a half; powdered Anise fruit, one ounce; powdered Stramonium leaves, two ounces; powdered Sumbal root, one ounce.

(3) Powdered Nitre, one and a half ounce; powdered Anise fruit, one ounce; powdered Stramonium leaves, two ounces; powdered Benzoin, one ounce.

The various forms of incense are wonderfully useful in the treatment of chronic bronchitis. Sometimes I buy it at the shops and sometimes have it made according to one or other of the following receipts:

No. I.

Styrax, - - - - - - - -	5 drachms.
Benzoin, - - - - - - - -	3 ounces.
Sumbal, - - - - - - - -	1 drachm.
Frankincense, - - - - -	5 drachms.

No. II.

Powdered Cascarilla, - - -	1 ounce.
„ Myrrh, - - - -	of each ½ ounce.
„ Styrax, - - - -	
„ Benzoin, - - - -	
„ Frankincense, - -	
Burgundy Pitch, - - - - -	

No. III.

Olibanum, - - - - - - - -	2 ounces.
Benzoin, - - - - - - - -	1 ounce.

Mr. Martindale, of New Cavendish Street, London, makes "Asthmatic Pastils" of chlorate of potash, nitre, and lycopodium. If burnt in the bedroom at night, they will be found wonderfully efficacious in allaying cough and easing shortness of breath.

Marshall's Cubeb Cigarettes and the "Cigares

Anti-Asthmatiques de M. Joy" are often used with advantage.

Arsenic taken internally is useful both in asthma and chrohic bronchitis, and arsenical cigarettes, made of paper impregnated with arsenate of soda, so that each contains about three-quarters of a grain of the salt, may often be prescribed with advantage. The patients should inhale the fumes strongly three or four times, taking them well into the chest. I have never known them produce any disagreeable symptoms.

Stramonium cigarettes, made from the leaves of the common thorn apple (*Datura Stramonium*), are frequently smoked with advantage. A special preparation, known as Datura Tatula, is still more efficacious. Whether it is a distinct species, or simply the Datura Stramonium cultivated with care and grown under favourable circumstances, I have not been able to ascertain. At all events it answers well in relieving dyspnœa, and patients frequently tell me that they smoke a pipe of it before going to bed and the first thing in the morning with advantage. Patients who live in the

country should cultivate their own stramonium, which will grow on any dungheap. For those who are not habitual smokers tobacco is a useful remedy. Most people, however—ladies included—are nowadays so accustomed to the use of the weed that tolerance has long since been established, and it is comparatively little used as an anti-spasmodic. For women who have never smoked, a good Turkish cigarette immediately after breakfast, or on retiring to rest, is often useful, facilitating expectoration and lessening dyspnœa.

As these fuming inhalations are used chiefly in cases of spasmodic dyspnœa, I may mention that I have found Grindelia Robusta useful in asthma, given internally in the form of the liquid extract. I remember one case especially, in which, for a time, it answered admirably. The patient, a young woman of nineteen, had suffered from spasmodic asthma for two years, and had been under treatment for eighteen months. Her attacks usually came on once or twice a week, but sometimes oftener. They lasted usually only five or six hours, but occasionally a couple of days. In the

intervals she was perfectly well and had no cough. On physical examination of the chest a little emphysema was detected, but nothing more. She was not febrile, her temperature taken at bedtime for three weeks ranging from 97·6° to 99·4° F. She had had a great deal of treatment, the list of remedies including arsenic, belladonna, ipecacuanha, lobelia, iodide of potassium, citrate of caffeine, stramonium and datura tatura, jaborandi and pilocarpine, Jamaica dogwood, quebracho and its alkaloid, nitrite of amyl, nitro-glycerine, iodide of ethyl, pure terebene resorcin, hypodermic injections of morphine and atropine, nitre papers and tablets, cubebs, cigarettes, Himrod's and the Green Mountain powders, and sprays and inhalations of all kinds. The first specimen of Grindelia Robusta was a sample sent me from America, and it answered admirably, relieving the spasm almost immediately. A supply was then obtained from a wholesale chemist in the City, but it had comparatively little effect. A specimen from a retail chemist was better. Finally a supply was sent over from America. The four specimens tried for

this patient might be arranged in the following order, according to their activity:

(1) American sample.
(2) American supply.
(3) Retail specimen.
(4) Wholesale specimen.

In prescribing Grindelia Robusta great care must be taken to see that the drug is a good quality. Many of the failures are, I am sure, attributable to the employment of unreliable preparations.

The following is a case of Winter Cough, accompanied by great shortness of breath, in which Grindelia Robusta did much good:

CASE I.—"Charles B., a carman, aged 32, has had a cough every winter for four or five years. He is free from it, as a rule, in the summer, but it is apt to return if he is exposed to cold or gets wet. He is greatly troubled with shortness of breath. The attacks come on usually about three in the morning, and often last four or five hours. He has had as many as three in the week. He often has these attacks in the summer, but they

are worse in the winter. The last week they have been so bad that he has been unable to go to work. They come on now quite independently of the cough. On examining the chest he is found to have cooing rhonchus all over both sides. Ordered an ounce of Liquid Extract of Grindelia Robusta, twenty drops in water every four hours. The same day he was better, and on the following day he was able to go to work. It did much good to the breathing, but hardly affected the cough. He continued taking the medicine for a month and derived much benefit from it."

In the following case, in which there was a double basic murmur, benefit was experienced:

CASE II.—"Jacob B., aged 56, has had a cough for a year, chiefly in the daytime, and chiefly on exertion. It is bad, but it is not nearly so bad as the shortness of breath. The attack comes on every morning about three and lasts an hour. He wheezes so much that he disturbs the house. He does not know what brings it on, but it is quite uninfluenced by food. He has had gout, and on examining the chest it is found that he has a

double basic murmur. Ordered twenty drops of the liquid extract of Grindelia Robusta, to be taken in water frequently. A week later he returned and said that the medicine had done good to the attacks; they lasted only ten minutes or a quarter of an hour, instead of an hour. The cough was about the same, and certainly was no better. The last three days he had taken twenty-five drops five or six times a day. During the following week the dose was increased to thirty drops, and this did even more good. The Grindelia was now stopped and a tonic substituted. The patient did not like this, and returned begging that the Grindelia might be continued. It acted promptly as before and gave the patient relief. He felt so much better that he was going to Paris for a week's holiday."

The next is a case of Spasmodic Asthma treated with Grindelia Robusta:

CASE III.—"Charles L., aged 47, a horsekeeper, wakes up in the morning about three or four o'clock with shortness of breath, which lasts twenty minutes or more. He cannot lie in bed, and often has to stand at the open window in his night-shirt.

This has been going on without intermission for three or four years. He is afraid he will break a bloodvessel. Sometimes the attack ends in vomiting. He is fairly well in the daytime except that he can never eat any breakfast. Ordered an ounce of the liquid extract of Grindelia Robusta, and told to take twenty drops in water three times a day, with an extra dose every quarter of an hour during the paroxysm. For the first two nights the patient was no better, but the third night he did not wake at all, but slept on till eight in the morning. It was the first night he had not been disturbed for a number of years. For the last three days he has been free from shortness of breath. The medicine was repeated for another week and the patient was seen at intervals for a month, but he remained perfectly well as regards the breathing."

INDEX.

INDEX.

"Anti-Siris," 59.
Arching of the Tongue, 37.
Arrested Phthisis, 1.
Arsenical Cigarettes, 165.
Asthmatic Pastilles, 161.
Atomisers, 108, 113.

Belgium, Use of Tar in, 62.
Benzol, 86.
Berkeley, The Right Rev. Dr. George, 57.
Bird, Dr. George, 126.
Blount's Aromatic Oil of Tar, 85.
Bronchial Asthma, 24.
Bronchial Casts, 5.
Bronchial Catarrh, 1, 30.
Bronchiectasis, 1, 5.
Bronchorrhœa, 4.

Casts, 5.
Catarrhe sec, 4.
Cheken and Cubebs, 117.
Children, Chloride of Ammonium Inhaler for, 149.
Chlorate of Potassium Gargle, 154.
Chronic Bronchitis, 1.
Cloyne, Lord Bishop of, 57.
Cough, 3.
Crichton, Sir Alexander, 60.
Cubebs, 126.
Cubeb Cigarettes, 164.

Datura Stramonium, 165.
Datura Tatula, 165.
Dragées of Tar, 67.
Dry Bronchitis, 4.
Dyspnœa, 3, 5.

Emphysema, 1, 6.
Expectorant Mixtures, 8.
Expectorants, 35.
Expectoration, Composition of the, 4.

Fermentation Experiments, 89.
Fibroid Phthisis, 20.
Fœtid Expectoration, 4.
Fountain Odorators, 35.
France, Use of Tar in, 62.
Fuming Inhalations, 159.

Grindelia Robusta, 166.

Hæmoptysis, 5.
Hale, on Tar Water, 60.
Hepatic Complications, 6.
Himrod's Powder, 162.
Hoarseness, 39, 41.

Incense, 163.
Inclement Weather as a Factor, 2.
Influence of Occupations, 2.
Iodide of Potassium Spray, 54.
Ipecacuanha Spray, 9.

Jaborandi Spray, 53.

Kidney Trouble, 6.

Lactic Acid, Fermentation, 92.
Laryngoscopical Examinations, 40.
Liquid Vaseline, 109.
Lividity of Face, 5.
Lobelia Powder, 162.
Lobelia Spray, 48, 51.
Loss of Flesh, 3.
Loss of Voice, 39.
Lycopodium for Pills, 66.

Mango Chutney, 101.
Mango-Terebene, 102.
Microscopical Examination of Expectoration, 4.

Nasal Mucous Membrane, Congestion of, 153.
Nitre Papers, 159.
Nostrils, Obstruction of, 155.
Number of Inhalations, 18.

Obstruction of the Nostrils, 155.
Oil of Cubebs, 137.
Ozone Papers, 161.

Paramæcia, Influence of Pure Terebene on, 90.
Paroxysmal Sneezing, 54.
Phthisis and Asthma, 21.
Physical Examination of the Chest, 6.
Phytolacca, 145.
Pinol, 111.
Pix liquida, 65.
Pure Terebene and its Allies, 88.

Sales-Girons, 61.
Scotch Fir, 65.
Secret Remedies, 9.
Shortness of Breath, 3.
Siegle's Apparatus, 34.
"Siris," 57.
Sirop de Goudron, 68.
Spasmodic Asthma, 171.
"Spirone," 55.
Spray Apparatus, 12.
Steam Atomisers, 33, 37.
Steam Sprays, 34.
Symptoms Enumerated, 3.
Syrup of Virginian Prune, 69.
Syrupus Picis Liquidæ, 68.

Tar and its Allies, 56.
Tar Chambers, 60.
Tar Water, 57.
Tartar Emetic Spray, 43.
Terebene, Pure, 88.
Text-book Treatment, 7.
Typical Cases, 11, 19, 29.

Ulceration of the Cords, 41.

Virginian Prune, 69.

Wallick, Surgeon-Major, 101.
Winter Cough, 1.

Yeast Fermentation, Influence of Pure Terebene on, 91.

WORKS BY THE SAME AUTHOR.

Crown 8vo, 3s. 6d.

NITRO-GLYCERINE AS A REMEDY

FOR

ANGINA PECTORIS.

NOTICES OF THE PRESS.

"The profession are much indebted to the author of this *brochure* for having introduced to their notice the important power possessed by nitro-glycerine in controlling the attacks of that most painful, alarming, and fateful condition, known as angina pectoris." —*Lancet.*

"Dr. Murrell's results show that nitro-glycerine is a very valuable remedy, with the additional advantage that its physiological action is definite and known."—*Practitioner.*

"Dr. Murrell has identified his name with this remedy, and here brings together his published papers concerning it in a connected form. Comparative sphgymographic tracings show well the main difference in its action from that of amyl-nitrite, viz., that the characteristic effect on the circulation and tension is more slowly produced, but lasts longer. Several of the cases are very striking and well illustrate the at least temporary advantage to be obtained from the drug."—*British Medical Journal.*

"To Dr. Murrell we must give the credit for the introduction of nitro-glycerine into practice, and especially for pointing out its value in certain cases of angina pectoris. This little book contains a short account of the history of the drug, and the notes of those cases of angina pectoris in which Dr. Murrell has administered it, together with some general remarks on the mode of administration, dosage, &c.".—*Birmingham Medical Review.*

"In this well arranged and clearly written little volume Dr. Murrell introduces to the serious notice of the profession a substance which has been long in use for its destructive powers, but which now promises well to do something for the relief of human suffering."—*London Medical Record.*

LONDON: H. K. LEWIS, 136 GOWER STREET, W.C.

Sixth edition, demy 32mo.

WHAT TO DO

IN

CASES OF POISONING.

NOTICES OF THE PRESS.

"It contains plain, straightforward directions for the treatment of the common poisons, and will be invaluable to practitioners."—*Lancet.*

"Without doubt the best monograph on the subject in any language."—*Cincinnati Lancet.*

"It is a handy little pocket-book which contains a series of extremely practical and accurate directions for the application of antidotes in cases of the treatment of poisons. It is the handiest and most complete of the kind that we have ever seen."—*British Medical Journal.*

"Every medical man in active practice ought to provide himself with a copy of this excellent little work."—*London Medical Record.*

"We cannot recommend it too highly."—*Hospital Gazette.*

"We cordially recommend this improved edition to the notice of our readers. No house surgeon or hospital resident pupil should hesitate to procure a copy for himself."—*Dublin Medical Journal.*

"The directions given could be safely carried out by any self-possessed individual, and the pharmacist would find it advantageous to have at hand so convenient and well arranged a reference to what should be done in cases of emergency."—*Pharmaceutical Journal.*

LONDON: H. K. LEWIS, 136 GOWER STREET, W.C.

Fourth edition, crown 8vo, illustrated, 4s. 6d.

MASSOTHERAPEUTICS;

OR,

MASSAGE AS A MODE OF TREATMENT.

NOTICES OF THE PRESS.

"Expresses views which will be thoroughly endorsed by every observant and thoughtful physician. All those who wish to obtain some idea of the meaning of massage and its possible spheres of utility should read Dr. Murrell's pleasantly written book."—*Lancet.*

"It cannot but cause great pleasure to anyone who has followed this little book on its journey of usefulness to see how it emerged from its modest little first edition and its gradual development into the handsome volume which is now before us. If books should be ranked by their usefulness, this one is entitled to be classed with those of the foremost place."—*The Medical Register.*

"This excellent *brochure* from an experienced pen will well repay a careful study, particularly just now when the value of massage as a therapeutic agent is coming to be widely known and appreciated."—*Dublin Medical Journal.*

"This little book contains considerable information concerning the classes of disease in which massage may prove of service, and the benefits which may be expected to result from its employment."—*New York Medical Record.*

"This valuable monograph is a complete *résumé* of the subject of massage."—*Medical Bulletin.*

LONDON: H. K. LEWIS, 136 GOWER STREET, W.C.

Illustrated, 2s.

LA PRATIQUE DU MASSAGE:

Action Physiologique Emploi Therapeutique.

TRANSLATED BY

DR. OSCAR JENNINGS.

WITH AN INTRODUCTION BY

DR. DUGARDIN-BEAUMETZ,

OF PARIS.

This is a new work, and contains, in addition to a complete *résumé* of the subject, articles specially contributed by leading Physicians and Surgeons in France.

LONDON: H. K. LEWIS, 136 GOWER STREET, W.C.

LANE MEDICAL LIBRARY

To avoid fine, this book should be returned on or before the date last stamped below.

L778 Murrell, W. 15239
M98 Chronic bronchitis &
1889 its treatment

NAME	DATE DUE